AVIATION WEEK

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FEB. 7, 1949

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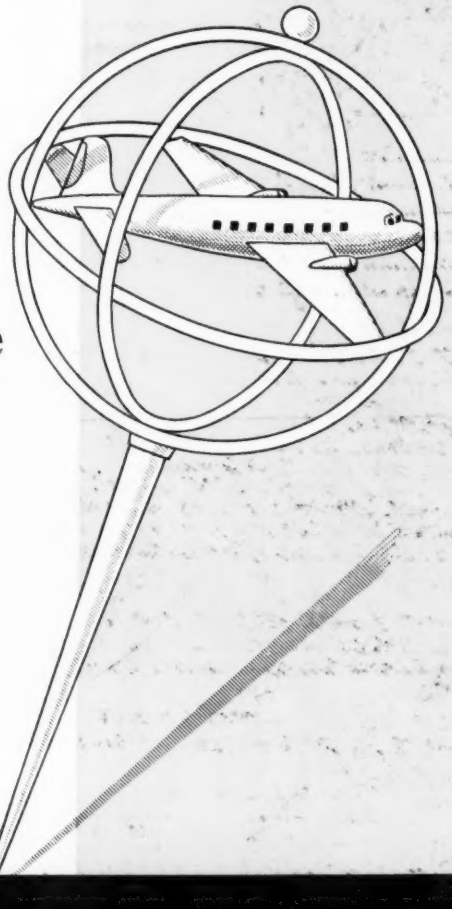

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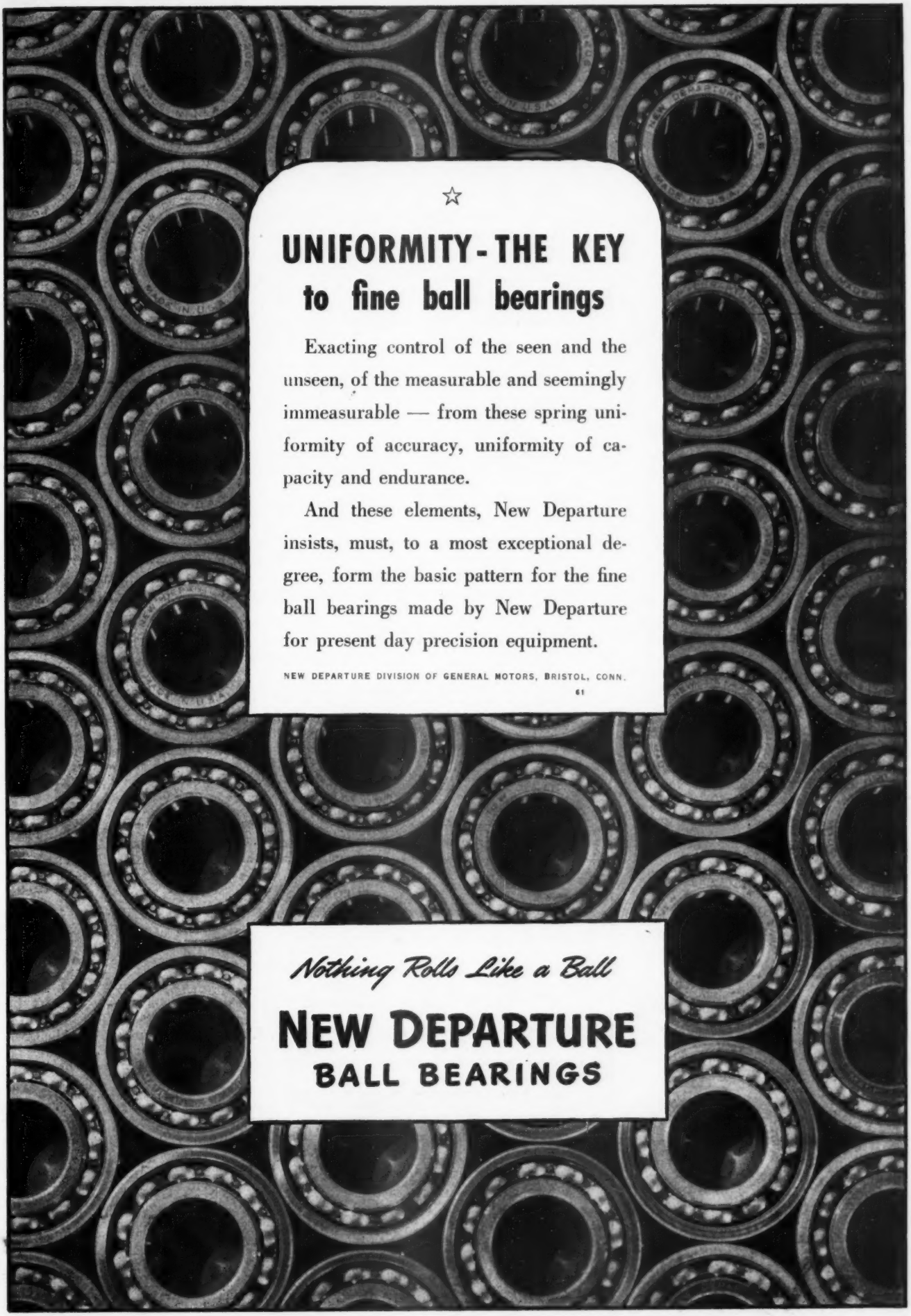
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such as landing gears, hydraulic struts, hydraulic actuators, gear boxes, transmissions, superchargers and variable speed drives, alternator drives and pressure regulator valves, Axelson is considered first choice by world leaders in aircraft manufacture.

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6160 South Boyle Ave.
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Vol. 50, No. 6

AVIATION WEEK

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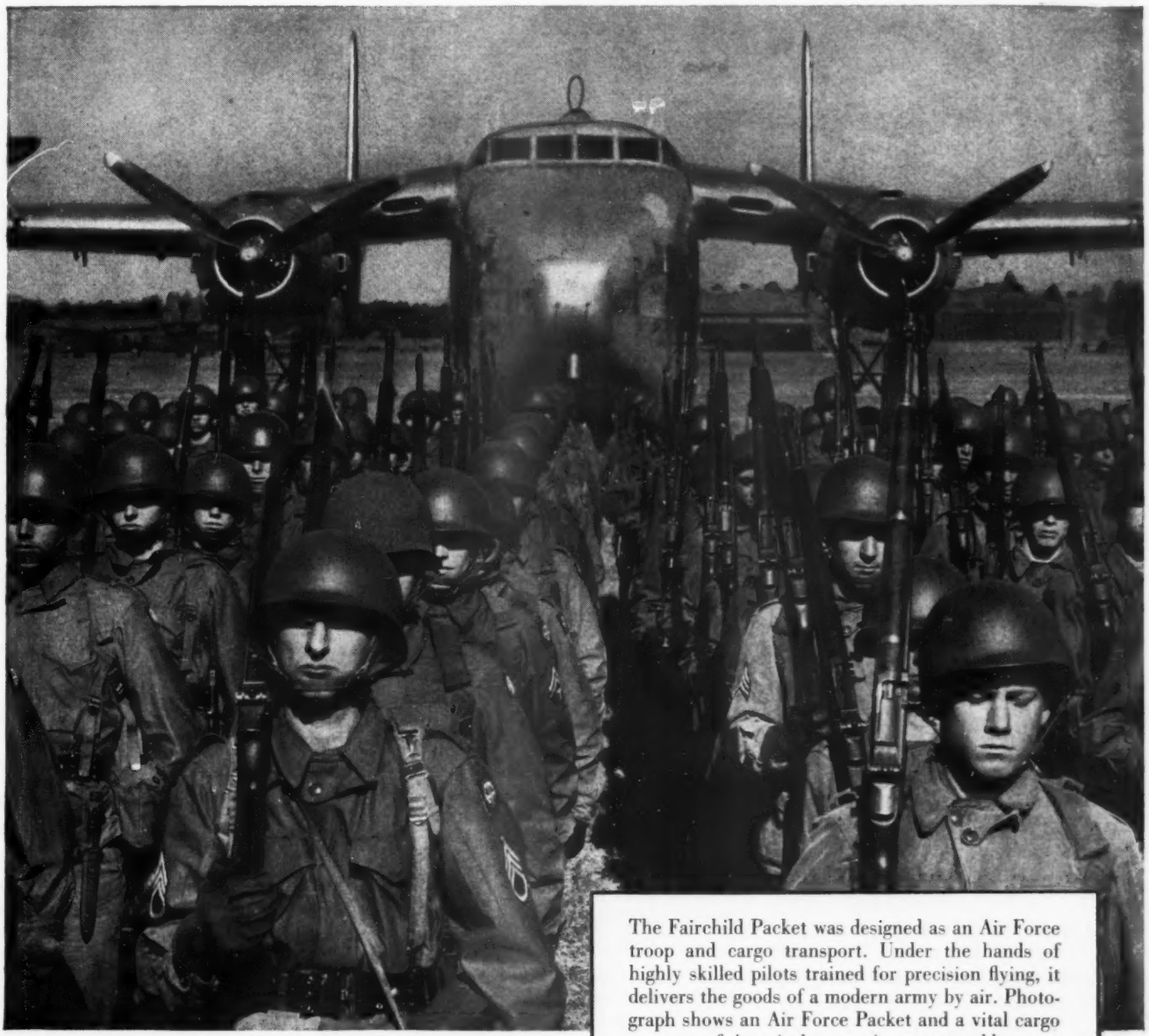

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NEWS SIDELIGHTS

Feederlines Problem

Feederlines may take covetous looks at Douglas' Super DC-3s, but their short-term franchises seem likely to prevent them from becoming customers—for the present, at least.

The feeders now operate about 50 DC-3s. Unless their temporary certificates are extended, all of the feeders will be out of business by January, 1952—nearly two years before extensive changes would be required on DC-3s to meet the higher performance standards of the transport category.

Money Men

Farm bloc Sen. Elmer Thomas (D., Okla.) is under heavy pressure from agricultural interests to slash national defense expenditures—so there would be more funds available for farm support subsidies.

Thomas is chairman of the Senate Appropriations subcommittee on the armed services which will consider Air Force, Navy and Army budgets for the coming year.

Other Democrats on the subcommittee with a big voice in deciding whether funds should be allowed for the 70-Group USAF program: Sen. Carl Hayden (Ariz.), Sen. Richard Russell (Ga.), Sen. Joseph O'Mahoney (Wyo.), Sen. Dennis Chavez (N. M.), Sen. Pat McCarran (Nev.), Sen. Burnet Maybank (S. C.), Sen. Lister Hill (Ala.), Sen. John McClellan (Ark.), and Sen. A. Willis Robertson (Va.).

The Republican members are Sen. Chan Gurney (S. D.), Sen. Styles Bridges (N. H.), Sen. Clyde Reed (Kans.), Sen. Homer Ferguson (Mich.), Sen. Kenneth Wherry (Nebr.), Sen. Guy Cordon (Ore.), Sen. Leverett Saltonstall (Mass.).

Commerce Shift

Texas' Rep. Lindley Beckworth (D.) is slated to become top man on aviation matters on the House Interstate and Foreign Commerce Committee.

Rep. Alfred Bulwinkle (D., N. C.), first in line for the chairmanship of the Aviation subcommittee, has been hospitalized for sometime and his health probably will not permit him to be active on the Capitol Hill over the coming months. In view of this, House Interstate's chairman, Rep. Robert Crosser (D., Ohio) plans to appoint Bulwinkle as chairman, and Beckworth as co-chairman.

End of Probe

Big surprise of the Senate Investigating Committee's recently-issued annual report is that it makes no mention of airline subsidies.

The committee's staff has been investigating the matter since last spring.

The probe was launched with fanfare by the group's ex-chairman, Sen. Homer Ferguson (R., Mich.) who announced at the time that he intended to disclose the extent to which politics has influenced CAB route awards that have resulted in alleged subsidy raids on the U. S. Treasury.

Committee Counsel Francis Flannagan reports that the staff's findings on airline subsidies are being turned over to Sen. Clyde Hooey (D., N.C.), successor to Ferguson in the chairmanship. Hooey is expected to file the material and shut the cabinet drawer.

Airline Support

Washington airline experts feel a public airing of their financial difficulties—as proposed by Senate Interstate and Foreign Commerce Committee's chairman, Sen. Edwin Johnson (D., Colo.)—would be a boon to airlines seeking mail pay rate increases from the Civil Aeronautics Board.

It could help to create a favorable congressional and public background for CAB liberality.

Committee members, generally, are sympathetic to the airlines' position—particularly Johnson, Sen. Warren Magnuson (D., Wash.), Sen. Lyndon Johnson (D., Tex.), Sen. Owen Brewster (R., Me.).

Airline representatives looking with favor on the probe suggested by Johnson point to the big congressional appropriations for airways facilities that have resulted from the Senate committee's air safety investigation of a few years ago that opened eyes to the need for the facilities.

Symington's Tip

Air Force Secretary W. Stuart Symington gave Washington reporters a tip on how the National Military Establishment splits its budget dollars.

Washington observers have long felt that the policy of Defense Secretary Forrestal was to split the budget into three equal slices regardless of the priorities indicated by overall defense strategy. Rep. Carl Vinson (D., Ga.) chairman of the House Armed Services Committee asked Symington what the Air Force could do if given the $800 million now budgeted for universal military training.

Symington answered: "Well, with one-third of $800. . . .

"I'm not talking about one-third. I mean all of it," Vinson interrupted. But the press table caught Symington's subtly made point.

Last year Forrestal testified that to increase the Air Force to 70 groups would cost $12 billion because both the Army and Navy would have to get a boost equal to the Air Force increase.

Reserve Shakeup

As predicted in AVIATION WEEK last Nov. 22, the appointment of Lieut. Gen. Elwood R. (Pete) Quesada as head of the USAF reserve program is producing a shakeup in the Air Reserve program.

Details of the Quesada program will probably not be announced until next summer but basic change is aimed at more intensive flight training with reduction in total numbers to be trained.

Quesada is also heading a board to study means of merging Air National Guard with USAF Reserves. This board will also determine the size, organization and training requirements of the new merged Air Reserve components.

Airports, Planes Rise

In the midst of reorganization huddles (AVIATION WEEK, Jan. 31), Civil Aeronautics Administration took time out to report some facts.

According to CAA, the U. S. had 6414 airports and 95,997 civil airplanes at the beginning of 1949.

Airports total was an increase of 655 over the total reported at the beginning of 1948, and the aircraft figure showed an increase of 1176 over planes registered at the beginning of 1948.

Electrical disconnect panels by BURNDY

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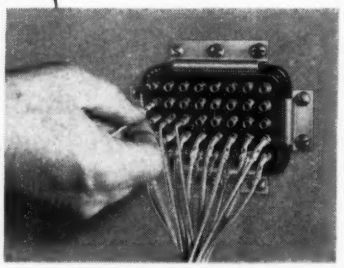

Burndy pressurized bulkhead panels feature positive locking of individual connections in the connector sockets; easy circuit identification. Pins for connection to panel are made for the popular conductor sizes. Several sizes of panels are available. Approved by USAF.

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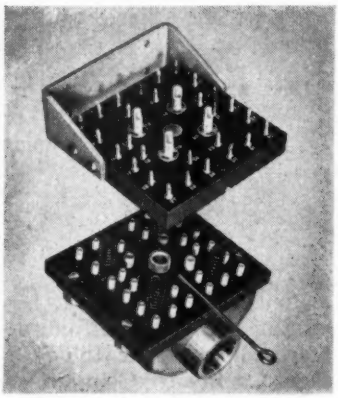

Burndy UMBILICAL DISCONNECTS for guided missiles, and DISCONNECTS for disposable fuel tanks, can be designed to specifications. Standard types are supplied to accommodate a variety of conductors for many voltages and currents. These disconnects consist of two parts, a stationary panel and an expendable portion which can be jettisoned by an electrical or mechanical release mechanism.

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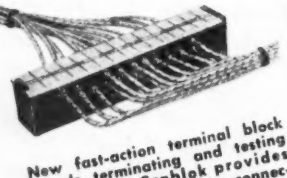

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AVIATION CALENDAR

Feb. 7-9—American Road Builders' Assn., 46th convention, Mayflower Hotel, Washington, D. C.

Feb. 8—ICAO Operations division, Montreal.

Feb. 8—Joint meeting, New York section of the Institute of the Aeronautical Sciences with the American Rocket Society, 29 W. 39 St., New York City.

Feb. 8—IAS Washington section meeting, Smithsonian Institution.

Feb. 19-27—National Sportsmen's Show, Grand Central Palace, New York.

Feb. 22—ICAO Airworthiness division, Montreal.

Feb. 23-24—Aerial agricultural spraying conference, Community Bldg., Manhattan, Kansas.

Feb. 24-25—4th annual aviation conference, Washington-Youree Hotel, Shreveport, La.

Feb. 26-27—Third annual Pacific Coast Midwinter Soaring Championships, Torrey Pines, San Diego, Calif.

Mar. 3—Society of Automotive Engineers, metropolitan section, air transport meeting, Engineering Societies Bldg., New York City.

Mar. 7-10—Institute of Radio Engineers Convention, Hotel Commodore, New York City.

Mar. 10-12—Annual meeting of American Society of Tool Engineers, Hotel William Penn, Pittsburgh.

Mar. 10-12—Seventeenth annual meeting, American Society of Tool Engineers, Hotel William Penn, Pittsburgh.

Mar. 14-16—Symposium on engineering research, Center for Continuation Study, University of Minnesota, Minneapolis.

Mar. 18—Annual national aircraft propulsion meeting, Hotel Carter, Cleveland, sponsored by IAS.

Mar. 22—ICAO African-Indian ocean air navigation meeting, Algiers.

Mar. 22-24—Air Transport Assn., annual airline engineering and maintenance conference Continental Hotel Kansas City.

Apr. 11-13—Society of Automotive Engineers national aeronautic and air transport meeting, Hotel New Yorker, New York.

Apr. 11-16—Western Metal Congress and Exposition, sponsored by American Society for Metals, Shrine Civic Auditorium, Los Angeles, Calif.

Apr. 19-21—AIEE, southwest district meeting, Baker Hotel, Dallas, Tex.

Apr. 22-24—Second Annual Oklahoma City Air Show, sponsored by Oklahoma City Chamber of Commerce.

Apr. 24-27—American Assn. of Airport Executives convention, Oklahoma City.

Apr. 25-27—American Association of Airport Executives Oklahoma City.

Apr. 28-29—Sixth IAS personal aircraft meeting, Hotel Allis, Wichita.

May 2-4—2nd annual meeting of the Airport Operators Council, Denver.

May 19-21—Society for Experimental Stress Analysis, spring meeting, Hotel Statler, Detroit, Mich.

May 23-24—Annual meeting of the Magnesium Assn., Edgewater Beach Hotel, Chicago.

May 24-27—Second joint conference of IAS, Royal Aeronautical Society, New York City.

June 3-12—Michigan Aviation Week.

June 20-24—AIEE, summer general meeting, New Ocean House, Swampscott, Mass.

July 3-4—First Annual Southern California International Air Race, Long Beach.

July 13—ICAO North Pacific regional air navigation meeting, Seattle.

July 20-21—IAS annual summer meeting, IAS building, Los Angeles.

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PLUS Uniweld, all-steel cab construction • New, heavier springs • Full-floating hypoid rear axles on ¾-ton and heavier duty models • All-round visibility with rear corner windows* • Specially designed brakes • Hydrovac power brakes on two-ton models • Ball-bearing steering • Double-line pre-selective power shift in 2-speed axle at extra cost on two-ton models • Wide base wheels • Standard cab-to-axle-length dimensions • Multiple color options.

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NEWS DIGEST

DOMESTIC

Civil aircraft shipments fell to 317, valued at $6,878,241 in November, a drop of 37 percent in number and 18 percent in value from October, Census Bureau reports. In same month, civil aircraft engine shipments were 193, and value of engines and parts was $3,319,463, an increase of 28 percent in value but decrease of 12 percent in number. November transport plane backlog was 182, compared to 339 in January, 1948.

Port of New York Authority and airlines serving New York last week still were holding meetings in an attempt to settle the Idlewild dispute.

Addison M. Rothrock, assistant director of aeronautical research, National Advisory Committee for Aeronautics, was elected vice president of the Society of Automotive Engineers representing aircraft powerplant activity.

Ralph V. Hunt, who recently resigned as vice president-comptroller, Douglas Aircraft Co., joined Touche, Niven, Bailey & Smart, certified public accountants, as resident partner in Los Angeles.

FINANCIAL

Air Associates, Inc. reports net profit of $4604 for quarter ended Dec. 31, 1948, on sales of $1,487,240, and after provision of $2800 for federal income taxes. On sales of $1,664,524 in the corresponding period of the preceding year the company lost $29,954.

Texas Engineering & Mfg. Co. expects final 1948 figures to show sales in excess of $9 million, rather than $8.5 million as previously reported, and a net income "substantially" above the 1947 net of $370,000 reported as the 1948 income figure in AVIATION WEEK, Jan. 31.

Menasco Mfg. Co. reported to Securities and Exchange Commission sales of $902,741 for the three months ended Dec. 31, 1948. Operations continue at a profit, according to President Henry P. Nelson.

FOREIGN

Britain has contributed nearly $16 million to the cost of the Berlin airlift, according to Undersecretary for Foreign Affairs Christopher Mayhew.

International Air Traffic maintained about the same level in November as in October, it is indicated by the transactions put through the IATA Clearing House in London. November transactions totaled $13,442,000, roughly the same as in the preceding month.

INDUSTRY OBSERVER

► New versions of the Bell X-1 will be capable of hitting Mach 2.04 and a speed of 1350 mph. above 35,000 ft., according to Larry Bell, president of Bell Aircraft Corp. Present version of the X-1 has hit a top speed of 1000 mph. which is Mach 1.5 above 35,000 ft. The four new models of the X-1 now under construction at Bell's Niagara Falls plant will have a 50 percent increase in fuel capacity. Meanwhile Capt. Charles Yeager, first supersonic pilot of the X-1, confirmed the fact that the X-1 has flown above 60,000 ft.

► Marine Helicopter Development Squadron at Quantico is scheduled to get a new version of the Piasecki HRP twin rotor transport helicopter. The new version, which will probably be designated HRP-2, will feature an all metal monocoque fuselage instead of the steel tube and fabric construction of the HRP-1. The all-metal fuselage is expected to eliminate most of the vibration now experienced in the HRP-1.

► Airplane division of Curtiss-Wright Corp. was given a $3 million contract to recondition 100 USAF Commando (C-46) twin engine transports. The planes are now in storage at Walnut Ridge, Ark. Another 100 C-46s will be reconditioned by Grand Central Airport Co., Glendale, Calif., under a $2.5 million contract. Curtiss-Wright Airplane division is also working on guided missiles.

► Revival of interest in use of JATO on four-engine transports to overcome runway limitations is indicated by CAA tests just completed in the South American Andes for Braniff. At La Paz, which has a downhill runway and elevation of 10,200 ft., tests were made with a DC-4 to determine what proportion of sea-level payload might be retained in using JATO at the La Paz Field.

► North American has received military go-ahead to modify part of its remaining order for B-45s to provide a new wing with greater fuel capacity to stretch the range of the four-jet medium bomber. Company has taken over Los Angeles Airport hangar used by Pan American as an international depot and soon will begin static tests on the new wing. PAA will move into the cluster of other airline ticket offices on north side of airport.

► Northrop is awaiting confirmation of its belief that modification of 10 piston engine B-35 Flying Wing bombers to jet power is not affected by the RB-49 jet wing bomber order cancellation, although the modification authority was supplemental to the 49 contract. Work on the modification is proceeding pending a final decision. "Several months" will be required for tooling up before the company can begin production of its recently approved order for 48 F-89 two-place all-weather twin-jet fighters. First of two prototype units flew last August, and the second now is nearing completion.

► North American Aviation will manufacture its T-28 military trainer at the company's Los Angeles Airport facility instead of at Downey, Calif., as planned originally. Production program calls for completion of static test unit by July 15 and completion of the first flying airplane by Sept. 2.

► United Helicopters' production schedule for the "Hiller 360" calls for one each working day beginning in May.

► Convair closed its commercial production year with 106 Convair-Liners delivered during 1948. A backlog of 52 transports remained for delivery this year. Company is hopeful of increasing this figure substantially through new orders through operation of subsidiary sales agency which will finance transport purchases. At last inquiry financing terms had not crystallized, and to this may be attributed failure of Convair to put more potentially hot prospects on the dotted line as firm buyers.

► Cross-over exhaust system developed by Piper and Lycoming engineers for use on the four-cylinder 115 hp. powerplant on the new four-place Piper Clipper is said to add approximately 7 hp. at static rpm. through more effective scavenging of exhaust gasses. Two cross-over tubes connect the exhaust ports of the front cylinders and the ports of the back cylinders. Front and rear exhausts are then piped to the muffler connection at the rear of the engine.

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AVIATION WEEK

February 7, 1949

How Congress Plans to Boost Air Force

Authorization for 70-Group strength first move; UMT fund diversion comes next.

Congressional strategy for boosting U. S. Air Force funds in the fiscal 1950 budget unfolded on Capitol Hill last week.

Tip-off came in opening hearings on the 70-Group USAF bill before the House Armed Services Committee headed by Rep. Carl A. Vinson (D. Ga.).

▶ **Congress Plan**—Here is what Congressional leaders plan:

• **Pass the Vinson-Tydings bill** authorizing the permanent strength of the regular U. S. Air Force at 70 groups plus 22 special squadrons and supporting reserve components.

• **Divert $800 million** now earmarked in the fiscal 1950 budget for Universal Military Training to USAF. This would boost USAF strength from the 48 combat groups now required by the budget to 57 groups and add $435 million to the $1.64 billion now earmarked for procurement of new aircraft in the fiscal 1950 budget. This would provide a total of $2.75 billion for new aircraft in fiscal 1950 compared with $2.04 in last year's record peace-time airpower appropriation.

• **Leave Naval Aviation** at the level called for in the fiscal 1950 budget—a 50 percent cut from 14,500 plane total to 7500 planes and a procurement cut from $753 million and 1165 planes in fiscal 1949 to $693 million and 850 planes this year.

▶ **Rayburn Comment**—This program has the strong backing of the House Armed Services Committee and its powerful leader, Vinson. It has also been tacitly approved by House Speaker Sam Rayburn (D. Tex.), with the comment: "Vinson usually gets what he wants up here." President Truman is not expected to make a vigorous fight against this congressional action because it does not involve the breaking of his defense budget ceiling. The powerful bloc of southern Democrats who are spearheading the fight for air power on the Hill this year are also needed in the Truman camp to pass the various key bills included in Truman's "fair deal" program.

If the $800 million now earmarked for UMT is diverted to USAF it will mean a boost in plane procurement from the 1669 now authorized in the fiscal 1950 budget to 2370—an increase of 702 planes. This is about the same number of planes USAF bought under fiscal 1949 authorizations.

▶ **Stretch Program**—It will leave USAF some $600 million short of the $2.7 billion in procurement funds required to fully implement the second step in the five-year expansion program begun last year. Vinson indicated that he would favor stretching the five-year program out to a seven year program which would bring USAF up to full strength of 70 regular groups equipped with post-war aircraft types in 1954 instead of the 1952 goal toward which USAF is now aiming.

The House committee hearings were featured by the testimony of Air Secretary W. Stuart Symington who once again stated his firm belief in the 70-Group Regular Air Force as the minimum military requirement for national defense regardless of the international situation.

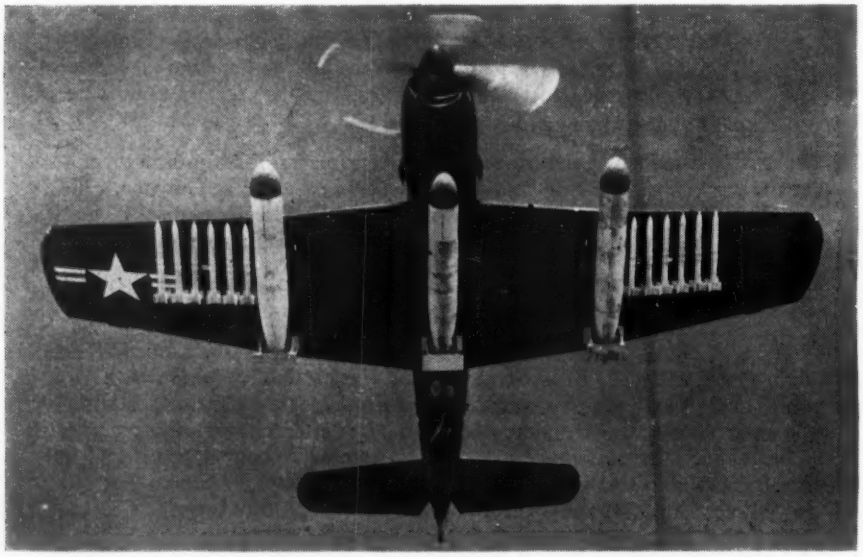
Symington made it quite clear that as a member of the Truman administration he is supporting the President's budget with its slash of the USAF to 48 combat groups because "they know more about the overall picture than we do."

Vinson's comment on Symington's testimony was:

"That makes the issue clear. If we had the money you would support what you consider the minimum requirement —a 70-Group program."

▶ **Some Disappointed**—Spectators at the hearing who expected Symington to make a stirring defense of the 70-Group program were disappointed, but informed observers believe that Symington's new strategy will get more concrete results for USAF than a public blast at the Truman administration on the air power issue. His testimony left no doubt among observers that Symington intends to stay on as Secretary of the Air Force in the new Truman administration.

Both aircraft industry spokesmen and congressional strategists opined that the fight for air power can be carried on more effectively by having a man of



MAULER PACKS A WALLOP

Glenn L. Martin Co.'s Mauler (AM-1) is shown carrying 9000 lb. of armament, the heaviest military load ever carried by a single engine plane. The single-seat Mauler, dubbed "Able Mable" by Navy pilots, is shown carrying three full size torpedoes, 12 rockets and four 20-mm cannon with full ammunition load. Mauler's gross on takeoff with this weight was 22,520 lb. Craft is powered by a 3250 hp. Pratt & Whitney Wasp Major engine and has a range of over 2000 miles.

Symington's stature within the administration backed by the vocal support of air power exponents both in Congress and outside the government.

► **Stock High**—Political observers also note that Symington's present standing within the new Truman administration is high. He recently presided over a testimonial dinner to Vice President Alben Barkley in New York. Among those present at a recent portrait presentation in Symington's office were Presidential aide, Clark Clifford, Secretary of the Treasury John Snyder and Senator Lyndon Johnson (D. Tex.), all powerful in inner administration circles.

Other highlights of Symington's testimony:

• Provision of four B-36 groups in the Strategic Air Command.

• Boosting long range photo plane requirements by one group to a total of six groups and reducing the medium bomb groups (B-50 and B-54) by one group.

Elimination of the airframe poundage requirements in the Vinson-Tydings 70-Group bill. This would state USAF authorizations in numbers of planes only leaving USAF to buy heavier planes without reducing its strength. As originally written the bill called for aircraft strength of 24,000 planes or 225,000 airframe tons leaving it to the air secretary to decide which yardstick to apply.

Boost Carrier Cost

Latest Navy estimates indicate that the cost of its 65,000 ton super-carrier (CVA-58) will be close to a quarter billion dollars.

This breaks down into $152 million for the carrier (original estimate was $124 million); $37 million for armament, radar, etc.; and approximately $50 million for the air groups to be put aboard the carrier. Work on the carrier has begun at Newport News, Va., with completion scheduled for 1953.

Navy has no firm estimate for the air groups since their composition will differ radically from air units now used aboard the big carriers. Larger and more expensive jet and composite powered planes such as the North American AJ-1, Chance Vought F7U and Douglas F3D will feature the carrier air groups of the future. Cost of an air group for a Midway class (45,000 tons) carrier, largest now in service, is about $34 million with about a 50 percent price increase indicated for the super-carrier's planes.

Shields

Vaughan

Kennedy

Wright

Curtiss-Wright Changes Continue

Vice Presidents Wright and Kennedy retire; Vaughan leaves for Europe; four new directors are elected.

Recasting of Curtiss-Wright Corp. top management under leadership of Paul Shields, new chairman of the executive committee, took place last week.

Changes included election of four new directors and retirement of two vice presidents. The withdrawal of Guy Vaughan, former president, now chairman of the board, from active participation in company affairs is expected to follow.

Added to the board are John A. McCone, West Coast industrialist and formerly member of the President's Air Policy Commission; Henry S. Sturgis, vice president, First National Bank of New York; J. F. McCarthy, Curtiss-Wright treasurer, and T. Roland Berner.

► **Led Dissenters**—Berner led a dissident group's attack on the management at last year's annual meeting of stockholders. He pressed for management changes and a special $7 cash dividend per share on common stock, but was defeated in a proxy contest. Later the company paid a $2 cash dividend on common shares.

The retiring vice presidents are Burdette S. Wright and William D. Kennedy, each with more than 20 years' service with the company or its divisions. Wright was vice president and general manager of the company's Airplane Division during the war, and is a former director. More recently, he was attached to the Washington office. Kennedy is a former vice president and general manager of Wright Aeronautical Corp., Curtiss-Wright subsidiary.

► **Vaughan Abroad**—These changes were announced after the monthly meeting of the Curtiss-Wright board in New York City, but there was no official comment on Vaughan's place in the picture. The board chairman left quietly for England the week before the meeting. The company did not disclose the exact nature of the trip, but sources there said it was as much for relaxation as anything else.

His part in company affairs has been decreasing for some time, and the trip abroad was expected in some quarters to be his last official act for Curtiss-Wright, to be followed by his retirement under an attractive pension arrangement.

Both Burdette Wright and William Kennedy were Vaughan appointees. Resignation as secretary of Mrs. Julia M. Scanlon, another close associate of Vaughan in the management of the company, was announced a few weeks ago. Vaughan was succeeded in the presidency last December by William C. Jordan (AVIATION WEEK, Dec. 20), who also is president of Wright Aeronautical, at Wood-Ridge, N. J. The company did not comment on the possibility that he might move to the New York office.

► **Major Plans**—What major company plans were prefaced by the board meeting after which some of these shifts were anounced is not yet apparent, but company observers see the move as the beginning of a new, aggressive policy under Shields' direction. Shields is senior partner of Shields & Co., New York investment house, and has been a director of Curtiss-Wright since Nov. 3. He has been executive committee chairman since December.

With the changes, Curtiss-Wright now may be able to reidentify itself with the production of planes. Since cancellation of its F-87 contract last October, its Airplane Division has not held a prime contract for any military aircraft.

Further significant financial readjustment may be attempted, whether in additional special cash dividends or reduction of capital structure through tenders of stock.

► **Financial**—Late in 1947, the company asked for tender of up to 500,000 shares of Class A stock at $20.50 per share. Only 204,983 shares were so tendered and retired. This left 953,719 shares of the issue outstanding.

The rest of the capital structure con-

sists of 7,432,039 shares of common stock. An additional cash dividend similar to that made last year may be dispersed on the common during 1949.

Informed observers look to the possible reduction of both classes of stock through the tender method. The company has more than $100 million in cash and liquid resources, considered in some financial quarters far above that needed for current operations. Such resources might be expected to facilitate a material reduction in the capital structure.

► **Merger Possibilities**—With the management changes and pending financial revisions, Curtiss-Wright will be in an improved bargaining position if it chooses to entertain suggestions of mergers with other aircraft units.

Official Air Force sources look with favor on reduction in the number of aircraft manufacturers, and since 1939 Curtiss-Wright's name has been linked prominently in speculation on such moves, first with Lockheed and lately with Convair and Northrop (AVIATION WEEK, Jan. 17).

Operation Haylift Wins Praise for USAF

United States Air Force won praise from western governors and congressmen last week for its "Operation Haylift" to save widely-dispersed snowbound cattle and sheep flocks in the range land from Nebraska to California —about a quarter of the country's land area.

When the most drastic snow storm within memory hit the area, all arteries of surface transportation were blocked. Feed droppings from USAF planes were the only hope for preventing large-scale starvation among some 2,000,000 cattle and sheep.

► **Three Missions**—During the first week of the storm, USAF, improvising in its new role, filled three missions in what became known as "Operation Haylift."

First, it speeded hay and concentrated feed supplies into the area from California and Chicago. The area's own stocks, like its livestock, for the most part were marooned in snow drifts.

Second, it launched "pinpoint bombing" of bales of hay to snow-locked flocks. USAF's biggest operation was out of the Fallon, Nev., Air Force Base from which 17 C-82 "Flying Boxcars" kept up steady rounds of flights.

Third, it rushed road-clearing equipment into the area.

The economic importance of the hay "bombing" is dubious. It succeeded in getting feed to only a small fraction of the area's flocks. Thousands of flights would have been required daily to blanket the range expanse with hay bombs. Then, too, targets were missed. Hay bales broke in mid-air, mixed with snow flakes, and dispersed over flock-less territory. But the fact stands that droppings from the air were the only recourse for staving off starvation of flocks. USAF performed at least a stop-gap mission, until road-clearing equipment arrived and made possible a surer way of getting feed to flocks.

Connie Survives Mid-Air Crash

With a 15-ft. gash in the top right side of the fuselage, a Pan American Constellation last week was landed safely at Mitchel Air Force Base, N. Y., after a private plane had plunged into it at a 4000-ft. altitude.

The PAA pilot, Capt. George Knuth, put the plane down without injury to passengers or crew five minutes after the collision. The Connie was bound from LaGuardia Field to London. Of the 23 passengers, 14 resumed the trip early the next morning in another PAA Constellation, five left on a later plane, and only one of the other four had definitely cancelled by middle of the week.

The collision occurred at 4:30 in the afternoon with visibility good. Knuth told investigators that he had just caught a glimpse of the smaller plane, a two-place Cessna, before the impact, and could not determine the direction of its flight. The two men in the Cessna were killed and parts of the engine and nose section were imbedded in the Constellation. The remainder of the small plane fell to the ground.

The Cessna struck the Connie just aft of the flight deck, tearing a huge hole in the fuselage above the galley. There was no apparent damage to controls, equipment or other parts of the Constellation structure. At midweek, PAA engineers still were undecided whether to dismantle the plane or to fly it out of Mitchel direct to PAA's base at Miami for repairs.

CAB investigators hold little hope of determining exactly what caused the collision. They speculated that the pilot of the small plane may have lost control of his craft, been stunting, or was in level flight and failed to see the Constellation, which was climbing.

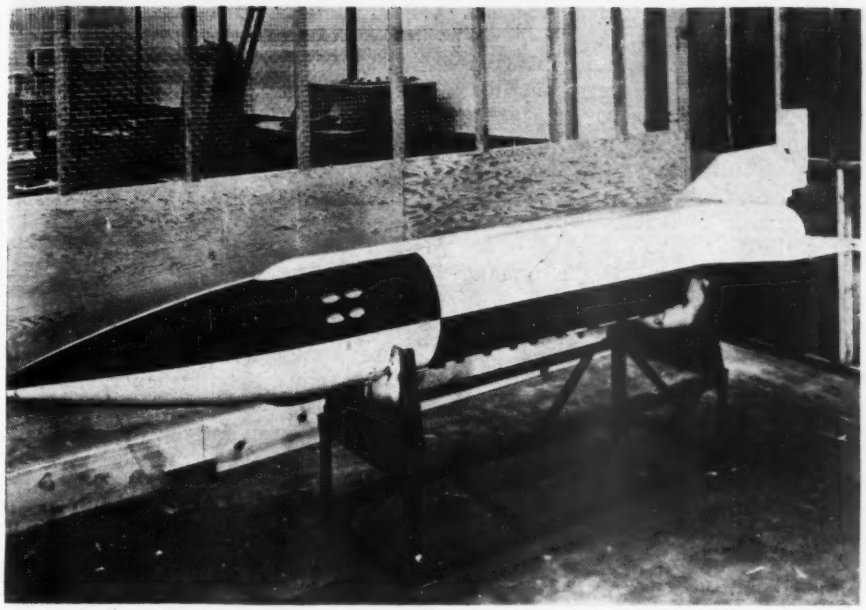
Pan American Gets First Stratocruiser

Pan American Airways last week accepted the first Boeing Stratocruiser and flew it to San Francisco from Portland, but service with the four-engine, 75-passenger transport is still more than a month away.

The first plane, "Clipper America," will go into operation on PAA's route to Honolulu late in March after extensive crew indoctrination flights. By that time, Pan Am should have more Stratocruisers. The next four planes released by Boeing also will go to Pan American, the original Stratocruiser customer.

Next on the list is American Overseas Airlines, to receive the first of its order for eight sometime in March. Later that month, Northwest Airlines is expected to take delivery on its first Stratocruiser. Scandinavian Airlines will get its first Boeing probably in April, United Air Lines in May, with British Overseas Airways Corp. tentatively scheduled to receive the first of its order in July.

After getting delivery on its first five planes, PAA is supposed to receive three Stratocruisers a month until its order for 20 is filled—probably in September. Boeing now expects to complete delivery of all 55 Stratocruisers on order by the end of this year.



NATIV at rest. Powered by a liquid fuel rocket motor, the missile has been launched successfully several times since initial firing last summer, has attained 10-mi. altitude.

Missiles Enter Production Stage

USAF to spend $26 million this year on guided weapons in addition to research; $28 million budgeted for 1950.

Guided missiles are passing from the developmental stage into limited production.

Approximately $26 million will be spent by the U. S. Air Force for guided missile procurement this year. USAF and Navy have approximately $28 million earmarked for guided missile procurement in the fiscal 1950 budget now being considered by Congress. This is in addition to research and development funds for guided missile experimentation.

▶**Training Missiles**—Gen. Hoyt Vandenberg, USAF chief of staff, announced that the $26 million appropriation recently approved by President Truman would be spent largely for training missiles and launching equipment needed to train USAF missile launching crews and technicians. Earlier Vandenberg revealed that USAF was expanding its first guided missiles group into a guided missiles wing (wings normally consist of three groups).

Legislation authorizing the USAF to construct a $200 million long range proving ground for guided missiles was introduced in Congress last week by Sen. Millard Tydings (D., Md.), chairman of the Senate Armed Services Committee.

The proving ground would be operated jointly by members of the USAF, Navy and Army.

▶**New Missiles**—Air Force also revealed two experimental missiles which it has tested successfully during the past six months. They are:

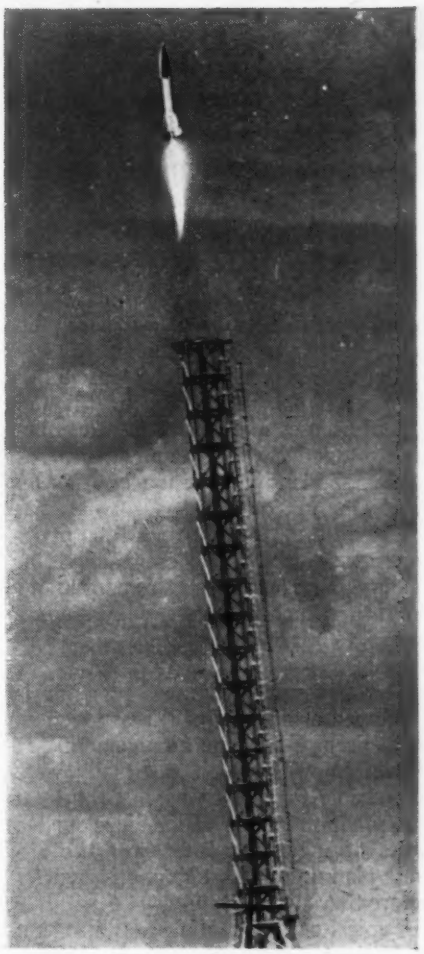
• **Convair 774**—This is a 32 ft. missile roughly similar to the German V-2 (45 ft.) It was built at Convair's San Diego plant and will be put into use as a training missile for USAF missile launching crews.

The Convair 774 was first fired successfully last summer at White Sands Proving Ground, N. M. The 774 was designed primarily as a test vehicle for experimentation with new launching techniques, fuels, and rocket propulsion motors. The missile will also be used in upper atmosphere research since it has a potential altitude of 100 miles.

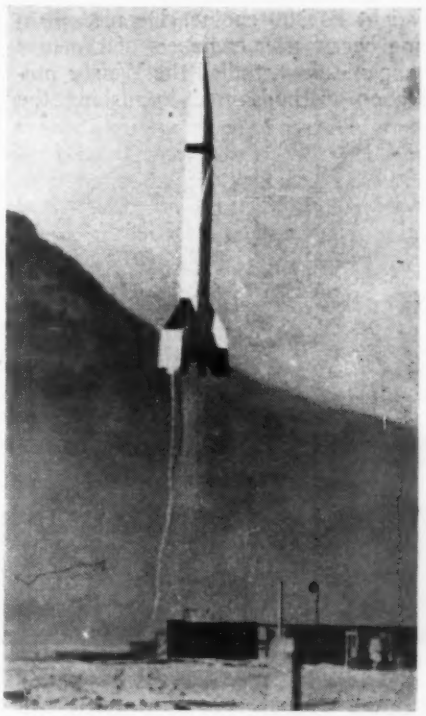
• **North American NATIV**—This test missile is 13 ft. long and was first fired last summer at Alamogordo, N. M. It will be used to test aerodynamic research in the development of control systems and also as a training vehicle for launching crews. It is fired from a tall metal tower and is guided by rails within the tower during the first few seconds after firing. The missile has attained an altitude of 10 miles during test firings.

NATIV was built by North American at its Inglewood plant.

USAF now has nine basic guided missile development contracts in the aircraft industry and has developed military requirements for 13 basic types of guided missiles.



NATIV takes off on test firing. The 13-ft. North American missile is guided in the initial seconds by metal framework.



Nearest thing to the V-2 that the Air Force has is Convair's 774—launched, like the V-2, from upright position without framework.

Flow Program

AMC-devised program designed to produce critical requirements.

By Alexander McSurely

DAYTON—Planning for an elaborate licensor-licensee program which can be rapidly activiated to produce critically needed Air Force requirements on a large scale basis in emergency is the goal of a series of industry meetings being conducted under the guidance of Industrial Planning division of Air Materiel Command.

Overall program calls for a total of 16 meetings covering 80 companies, including the 16 licensor companies and the other manufacturers who are expected to make the products under license.

▶ **New Program**—The new program is developed as a result of the experiences with licensor-licensee arrangements in World War II which eventually were responsible for a large part of the total war production but which developed a series of major headaches for the aircraft planning and production agencies before they started rolling.

Typical of the meetings was a session at Wright Aeronautical Corp., Wood-Ridge, N. J., attended by representatives of Continental, Jacobs, and Ranger engine companies to study technical problems involved in production of the Wright R-2300 engine. Detailed planning began after engineers of the four companies had studied the Wright production methods used in making the engine and had toured the engine plant, examining parts, etc.

▶ **Study Agreements**—The licensor company was asked to circulate to the other manufacturers a proposed agreement for study and reconsideration at a second meeting. Considered in the agreement are such items as:

- Legal rights and responsibilities of both parties.
- Engineering control of the product and production changes.
- Policy for field service.

Lt. Col. W. R. Carter, chief of the mobilization planning section of the AMC Industrial Planning division, who is charged with developing this licensor-licensee program, hopes to develop a standardized licensor-licensee agreement for the program which will be flexible enough to meet various needed changes depending on the product, plant layout, equipment list, flow sheets, parts, materials, etc.

▶ **Selection Plan**—Selection of the licensee companies is planned as a cooperative arrangement between the AMC industrial specialists and the licensor companies whose concurrence in selection is, of course, essential. Each licensee is expected to furnish a complete end item and is responsible for any subcontracting necessary for the completion of the article.

Col. Carter says the overall program is aimed at achieving the following objectives:

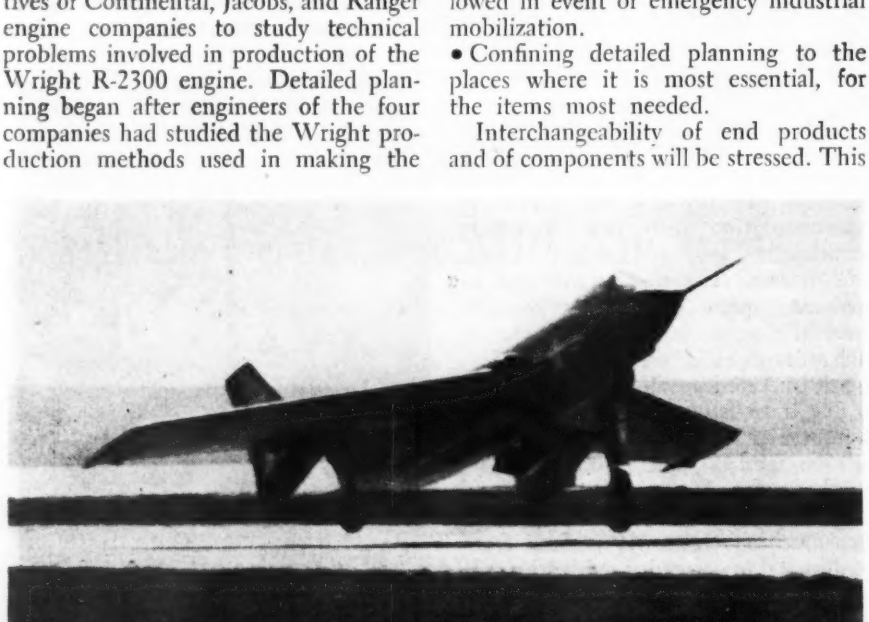
- Giving a definite pattern to be followed in event of emergency industrial mobilization.
- Confining detailed planning to the places where it is most essential, for the items most needed.

Interchangeability of end products and of components will be stressed. This was something that was not always achieved in the wild scramble of the early days of World War II, and it is one of the main reasons why pressure was so heavy in the early days of the last war.

▶ **Flow Goal**—Basic theory on product changes is that they should flow from the engineering department of the licensor to the licensees. AMC planners see no reason why licensee engineers may not propose product changes also, as long as they are cleared through the licensors' engineering control and do not interfere with interchangeability.

AMC plans are being conducted subject to allowances for the industrial requirements of the other services and the overall allocations of industrial capacity made by the Munitions Board.

Similar licensor-licensee meetings have been held at North American Aviation, Inc., Inglewood, Calif. and Pratt & Whitney division of United Aircraft Corp., Hartford, Conn.



CUTLASS ON TAKEOFF

Unusually high angle of attack during takeoff of Chance Vought's twin jet Cutlass is shown here as the swept-wing experimental fighter leaves Patuxent River, Md., on first leg of a cross country hop to Dallas. Needle-nosed housing for experimental test equipment replaces the booms formerly mounted on each wing tip.

T-H Substitute Affects Manufacturers

The Thomas-Lesinski bill for replacing the Taft-Hartley law with a somewhat modified version of the Wagner Act continues the exemption of employers—including the airlines—who are subject to the Railway Labor Act.

It directly affects, however, aircraft manufacturers and other employers whose activities affect interstate commerce.

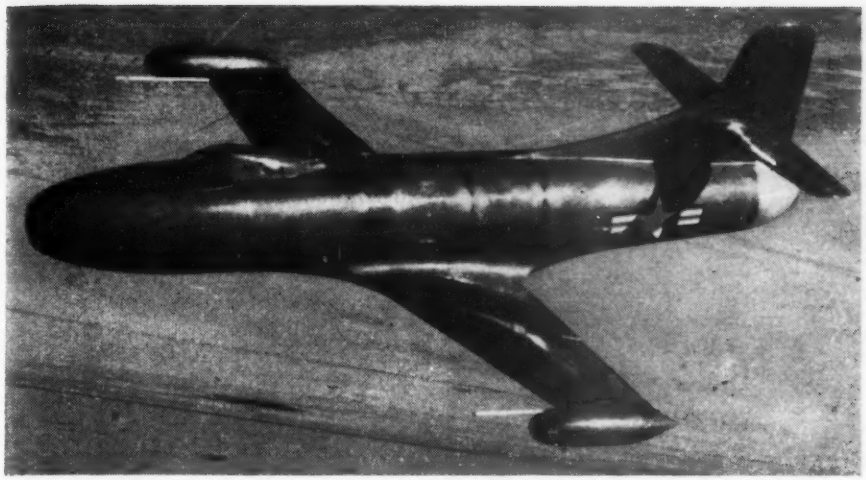
The bill was written under White House guidance and is based on suggestions made by President Truman in his state of the Union message in 1947 and last month. It repeals Taft-Hartley and reenacts the Wagner Act with some amendments.

This is how manufacturers would be affected by the amendments of the Thomas-Lesinski bill:

▶ **Jurisdictional Disputes and Secondary Boycotts**—These would be unfair labor practices, but only if they involve disputes between two unions. A union could refuse, for instance, to permit its members to handle products made by non-union labor or to work beside non-union men. But it would be unfair for an AFL union to handle products made by a CIO union.

Jurisdictional disputes would be decided by the National Labor Relations Board or an arbitrator selected by it, but there would be no compulsion against a strike until the decision is enforced through a court order. An employer who refuses to assign a work task in accordance with a jurisdictional award would be guilt of an unfair labor practice.

▶ **Closed Shop**—This would be restored



TIP TANKS FOR THE D-558-I

Navy has fitted small tip tanks to the Douglas D-558-I Skystreak to increase its test time at high speed. The tanks are small (75 gal. ea.) to hold drag losses to a minimum. They are located centrally in the wing plane to increase effective aspect ratio which improves the takeoff and landing characteristics of the high-speed research plane. Stability and control tests of the red speedster continue at Muroc AFB.

in the new federal law. Also, the precedent now given to more restrictive anti-closed shop laws in 15 states would be killed. The new law would take precedent over state laws on this issue for employers who come under federal jurisdiction.

► **Dispute Notice**—The employer, as well as the union, would have to file a 30-day notice with the U. S. Conciliation Service before either could terminate or revise a labor contract. Failure to do so would be considered an unfair labor practice.

► **Contract Interpretation**—The bill declares it a public policy that all contracts include procedure for arbitration of all disputes over interpretation of the contract.

► **National Emergencies**—They would be handled along the lines of the Railway Labor Act, with recommendations by fact-finding boards, but no injunction.

Gone from the law would be the special bargaining rights for craft unions, professional employees and plant guards. Bargaining rights held by foremen under the Wagner Act would be restored.

Unions no longer would have to file non-Communist affidavits in order to get assistance from NLRB. This clause in Taft-Hartley has hurt the left-wing CIO unions and helped clean the Communist leadership out of the CIO local at Allis-Chalmers plant in Milwaukee.

Republican strategy is to offer many desirable parts of Taft-Hartley as amendments to the Thomas-Lesinski bill on the Senate floor. Some seem likely to get by. There's a good chance that the non-Communist clause will be kept and extended to include employers. Foremen may get only limited rights, such as requiring foremen's unions to remain independent of rank-and-file unions in order to have bargaining protection.

"Hatchet Job" To Be Investigation Target

Convair's B-36 long range bomber continued to be the center of controversy last week.

New developments:

• **Record bomb load** of 42 tons was carried by a B-36 from Ft. Worth and dropped on the Muroc, Calif. practice bombing range. The B-36 damaged one main landing gear on landing at Ft. Worth.

• **Promise of an investigation** into the sources of what Air Secretary W. Stuart Symington called the "best hatchet job I have ever seen in Washington", allegedly executed on the Convair B-36.

• **Pointed defense** of USAF purchase of additional Convair B-36s by Symington who termed the six-engined bomber now capable of longer ranges and higher altitudes than any other bomber in the world. He also said it would soon be the fastest bomber in service. Informed observers believed Symington was referring to the RB-36 which will have four jet engines in addition to its six Pratt & Whitney Wasp Major piston engines.

The "hatchet job" to which Symington referred was climaxed recently by a series of bitter attacks on the big bomber by radio commentators who referred to it as a "sitting duck" for jet fighters. Criticism of the plane had also stemmed from USAF generals who, at least in the early stages of test flying the plane, were not impressed with its performance prospects or operational possibilities.

► **Preparing Dossier**—USAF is now preparing a lengthy case history of the Convair B-36 project which will seek to combat critics of the giant plane by making virtually all the facts on the project available to the press. USAF sponsored a press tour to Convair's Ft. Worth plant last fall to offset many of the rumors then current about the obsolescence of the giant bomber. USAF officials were amazingly frank in permitting newsmen to go over the B-36 with few security restrictions.

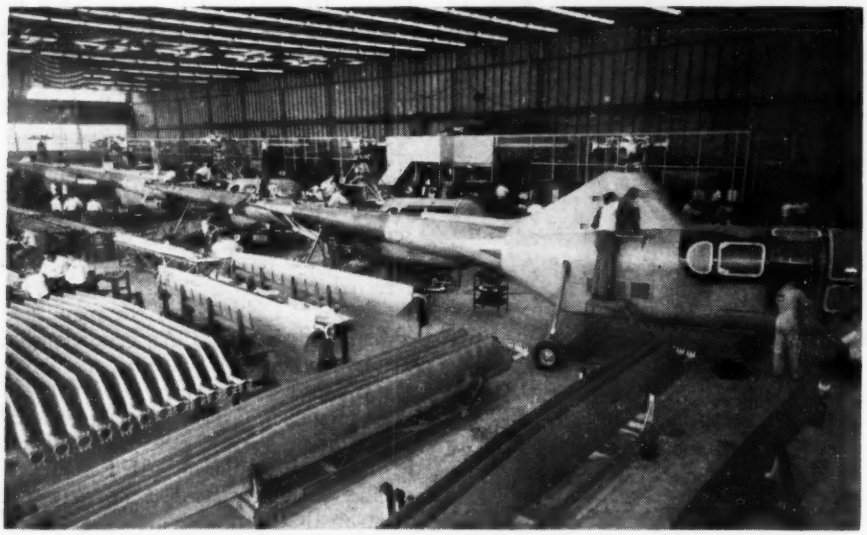
The record bomb load was carried as two 21-ton practice bombs with non-explosive war heads. This was exactly twice the previous bomb load record set by a B-29 last summer carrying one of the 21 ton missiles.

► **Average 250 Mph.**—The B-36 averaged over 250 mph. for the 2900-mi. round trip flight. It made its bombing runs at a true air speed of over 350 mph. First bomb was released at 35,000 ft. and the second at about 41,000 ft. Both bombs were carried internally in the B-36's 85 ft. long bomb bay.

ALASKAN WINTER TESTS

With drop tanks tucked under its sweptback wings, this Air Force F-86 is headed for flight and ground tests at temperatures 50 deg. below zero at Ladd Field, Fairbanks, Alaska, as part of a USAF super-cold winterization program. The North American built craft left from Los Angeles Airport on the first leg of the trip to the Alaskan base.

PRODUCTION



Sikorsky Adds to Plant Space

Larger, more modern buildings increase production facilities and make possible higher rate of output.

Expansion of Sikorsky Aircraft's production space by approximately 40 percent in a building program just completed definitely gives notice that the Helicopter division of United Aircraft Corp. expects to remain in its Bridgeport, Conn., location for the foreseeable future.

New brick and steel building 132 x 340 ft. with clear span of 132 ft. houses both helicopter and main rotor blade production lines, and contains one of the largest and most modern paint spray shops in the country. A new hangar 132 x 140 ft. adjoins the production building. It has a 120 ft. door opening with 25 ft. clearance expected to be adequate for any helicopter in production in the next few years. A new pilot ready room and flight office, overlooking the Sikorsky Heliport, adjoin the hangar.

► **Replacement Structure** – Subassembly and material control stations which feed the main production line are located in an adjoining steel and brick building, 88 x 340 ft. which is a replacement for a brick structure dating back to 1903.

The new construction which totals 94,026 sq. ft. added to existing facilities provides Sikorsky with the most complete helicopter manufacturing facilities in this country, according to B. L. Whelan, manager. A straight line flow of materials and assemblies is now possible, with much improved manufacturing efficiency.

► **Modern Facilities**—Better ventilation, fluorescent lighting, a new medical department, rest rooms and facilities "in accordance with most modern factory practices" are now provided.

Architects Albert Kahn & Associates are planning a face-lifting operation for the adjacent older structures, including painting and new window installations, to harmonize with the modernistic design of the new buildings.

► **Six-A-Month**—Sikorsky production currently is centered on its four-place Pratt & Whitney Wasp-Jr. powered S-51 helicopter.

This model is currently being sold for civilian use, and with modifications to the Air Force and Navy as the H5-G and the HO3s. Production is at the rate of six machines a month, but could go much higher if necessary with the new facilities.

Two experimental five-place Navy helicopters designated XHJS-1, powered with 500 hp. Wright Continental engines and with all-metal rotor blades are currently under test at Patuxent Naval Air Station.

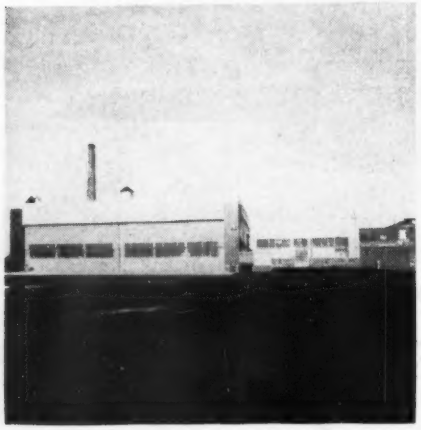
► **S-52 Tests**—A revised version of the S-52 two-place helicopter, which was demonstrated last summer by a landing within the Pentagon Building court at Washington (AVIATION WEEK, June 28), is now at Wright Field, Dayton, Ohio for Air Force tests.

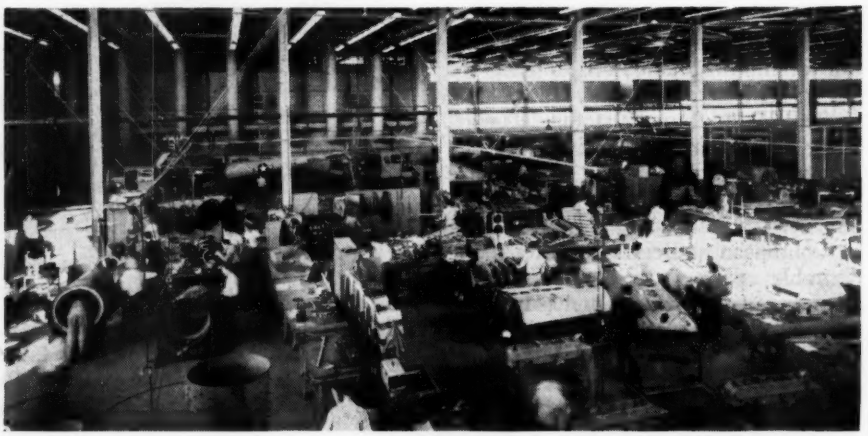
Plans for still larger helicopters at Sikorsky are in early development stages.

Pentecost Out

Horace Pentecost, inventor of the Hoppi-Copter, has been succeeded as president of Hoppi-Copters, Inc., by T. H. MacLachlan of Seattle, Wash., who has been identified with the shipbuilding industry of that area.

Following MacLachlan's election, Pentecost submitted his resignation as director and chief engineer of the corporation, but the board of directors has refused to accept it. Pentecost retains a controlling interest in Hoppi-Copters, Ltd., which is proceeding with development of the one-man helicopter in England. The Seattle firm insists that Pentecost's interest in the English company is simply as its representative, however.





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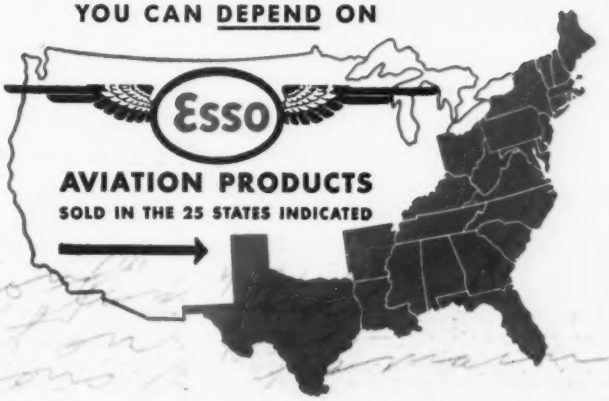

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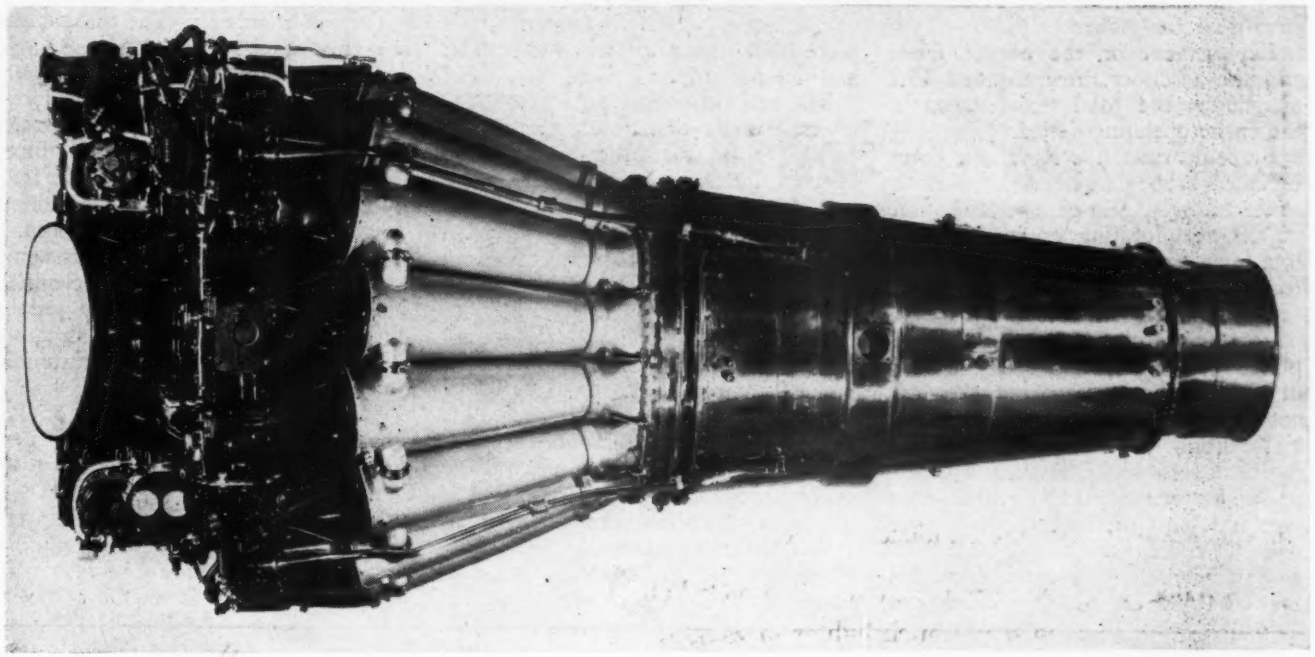


Severe Test Proves Turbojet Reliability

Standard Goblin engine withstands punishing demands of simulated fighter combat operation in 500-hr. run.

Turbojet reliability reached a new high in a recent grueling trial run in which a deHavilland Goblin 2 completed 500 hr. under what are considered to be the most severe test conditions ever devised.

While it has been customary to think of the turbojet engine as in its "Model T infancy," this British accomplishment stamps the new engine with a distinctive maturity.

Only two minor changes were made—the burner fuel filters were changed after 303 hr., and a minor accessory drive was replaced after 308 hr.

► **Theory Underlying Trials**—The tests were devised to simulate the actual demands on a typical turbojet in fighter operation. These demands are considerably more severe than those made on the reciprocating engine, since the latter spends nearly its entire operating life at cruising speed with infrequent and short periods of maximum speed operation (takeoff and climb for five min.).

In contrast, the turbojet engine, particularly in a fighter installation, spends most of its life at near-maximum speed in takeoff, long climbs, maximum speed level flight and high-speed cruise.

It is logical, then, that the test requirements for the turbojet should be considerably more severe than those for the conventional reciprocating engine.

It was this consideration that prompted Air Marshal Sir Alec Coryton, British Ministry of Supply, to initiate the Goblin test as a simulation of wartime jet interceptor operating condition—constant repetition of combat missions with little or no maintenance between flights.

A standard Goblin 2 was taken at random from the production line and installed in one of the test cells of deHavilland Engine Co., Ltd. at Hatfield.

The engine was subjected to 462 test cycles of 65 min. each, with a 10-min. "rest" between cycles. Each cycle consisted of a simulated flight as outlined in the accompanying tabulation.

► **Test Factors**—Although ram was simulated, normal altitude temperature conditions were not reproduced with the result that the engine operated at unfavorable sea level temperatures rather than the far more favorable low temperatures of high altitude.

Sudden changes in speed and temperature of the turbine, which occurred an average of once every 5-10 min. of running time, comprised extremely severe conditions. The 500 hr. of operation actually required 462 starts, 2772 rapid accelerations, 50 hr. at maximum power for takeoff and combat, 394 hr. at maximum climbing power

Test Cycle of Goblin 2 Engine

Condition	Time, min.
1. Start and run at ground idling: 3000 rpm	1.5
2. Taxiing: 5000 rpm. with three accelerations from 3000 to 7000 rpm	5.0
3. Maximum power takeoff: 10,200 rpm	1.5
4. Maximum climb: 9700 rpm.	5.0
5. Maximum cruise: 8700 rpm.	35.0
6. Combat maximum power: 10,200 rpm.	5.0
7. Descent: 7000 rpm	7.0
8. Taxiing: repeat 2, above	5.0
9. Shutdown for 10 min. standby	10.0
Total engine operating time	65.0
Total time of complete cycle	75.0

and 269½ hr. at maximum cruise.

The engine burned 163,200 gal. of kerosene and 63 gal. of oil during the period. The tests required seven weeks for completion, an average of 12 flights daily, and equivalent to eight nonstop circuits of the globe.

Replacement of the burner filters and the accessory drive required 13.2 man-hours, the total maintenance of the entire operating period.

By comparison, the Royal Air Force expends 1286 man-hours of maintenance for every 500 hr. operating time on its reciprocating engines, an astonishing comparison in maintenance requirements between the two types.

Actually, however, several other components would normally have been replaced during this period of operation of the turbojet engine but this was not done because of nature of test.

► **Condition of Components**—Following the grueling run, inspection of the engine revealed surprisingly little damage, and most of the components apparently could have continued in operation indefinitely. A study indicated that the cost of parts necessary to bring the engine up to full new-engine factory standard was only about 10 percent of the total cost of a new engine.

Worst hit by the test were the flame tubes, a result exactly as predicted. One of the tubes actually fractured and a piece of it passed through the turbine and out the tailpipe.

The tubes showed typical heat-shock crystallization. Some were badly malformed and still others were little affected, indicating uneven fuel mixing and temperature distribution around the combustion section.

Combustion chamber casing showed only slight wear from flame tube rubbing.

Chamber dome head experienced carbon deposition but the air holes remained completely free.

Burners bore heavy carbon deposits on the lip of the shroud, but experience indicates that this takes place early in the life of the engine and stabilizes at this point with no additional deposition.

Spray nozzles remained clean.

As was to be expected, the compressor showed no signs of wear.

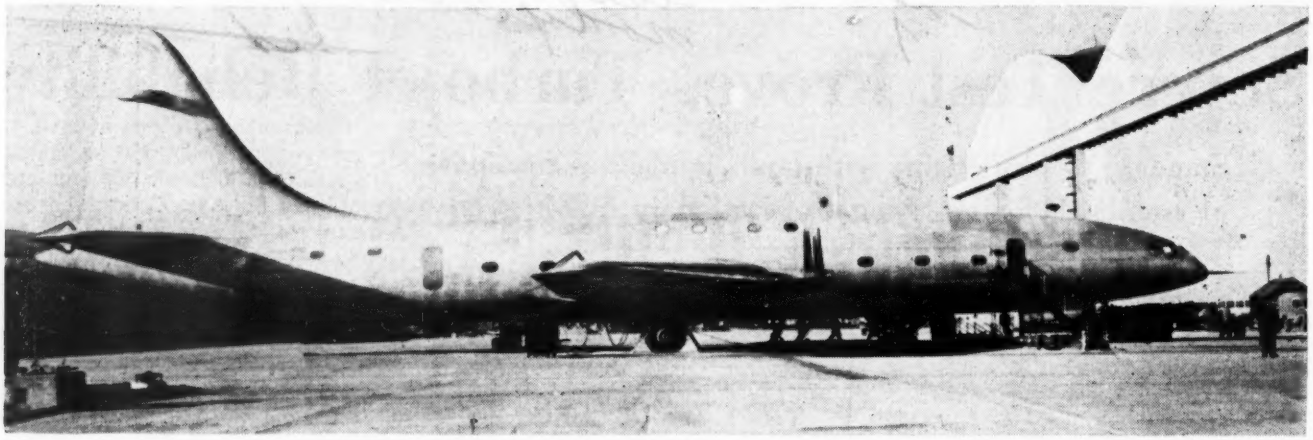
Turbine inlet duct assembly containing the nozzle guide vanes and diaphragm plate was in good condition after the test. Although carbonized oil deposits were observed, these are a normal result of extensive running.

► **Turbine Stands Up**—The turbine was in perfect shape after the test, the single assembly watched most carefully throughout. Some blades were nicked by the flame tube piece which came loose and passed through the turbine, but otherwise there was no blade fracture, warping or bending. Maximum radial growth of blading was 0.001 in.

The tailpipe, including inner cone, supporting struts and attaching channel, survived the test without any serious buckling or cracking. This assembly has been a constant source of trouble until recent months.

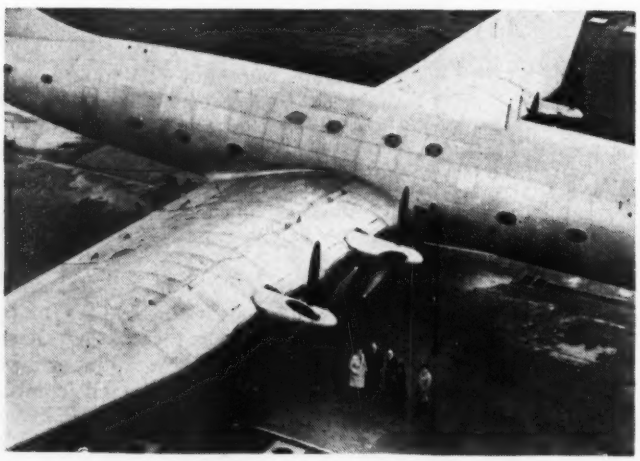
The D. H. Goblin test marks a milestone in turbojet progress and provides a significant indication of future endurance of this new engine.

With durability no longer a pressing factor, there remains only the solution of fuel consumption problem to widen the usefulness of the turbojet.



FLIGHT DATE NEARS FOR BRABAZON

Bristol Aeroplane Co.'s Brabazon, 100-passenger transport, is now undergoing engine run-up tests at Filton, England, preparatory to first flight trials. Craft's 8 Centaurus powerplants are designed to develop 20,000 hp. for takeoff. Maximum gross weight is 290,000 lb.; span is 230 ft.; length, 177 ft. Estimated performance figures are: Maximum continuous cruising speed, 250 mph. at 25,000 ft.; initial climb, 600 fpm.; takeoff over 50 ft., 2300 yd.; range, 5000 statute mi. with 24,000-lb. load at maximum continuous cruise at 25,000 ft. Hooded mass balances on control surfaces are to protect against flutter which could occur if air enters hydraulic system.



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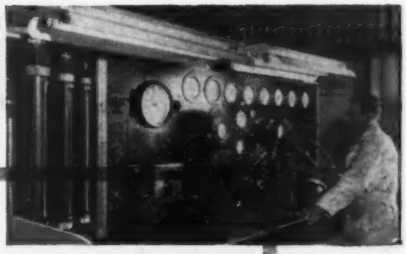

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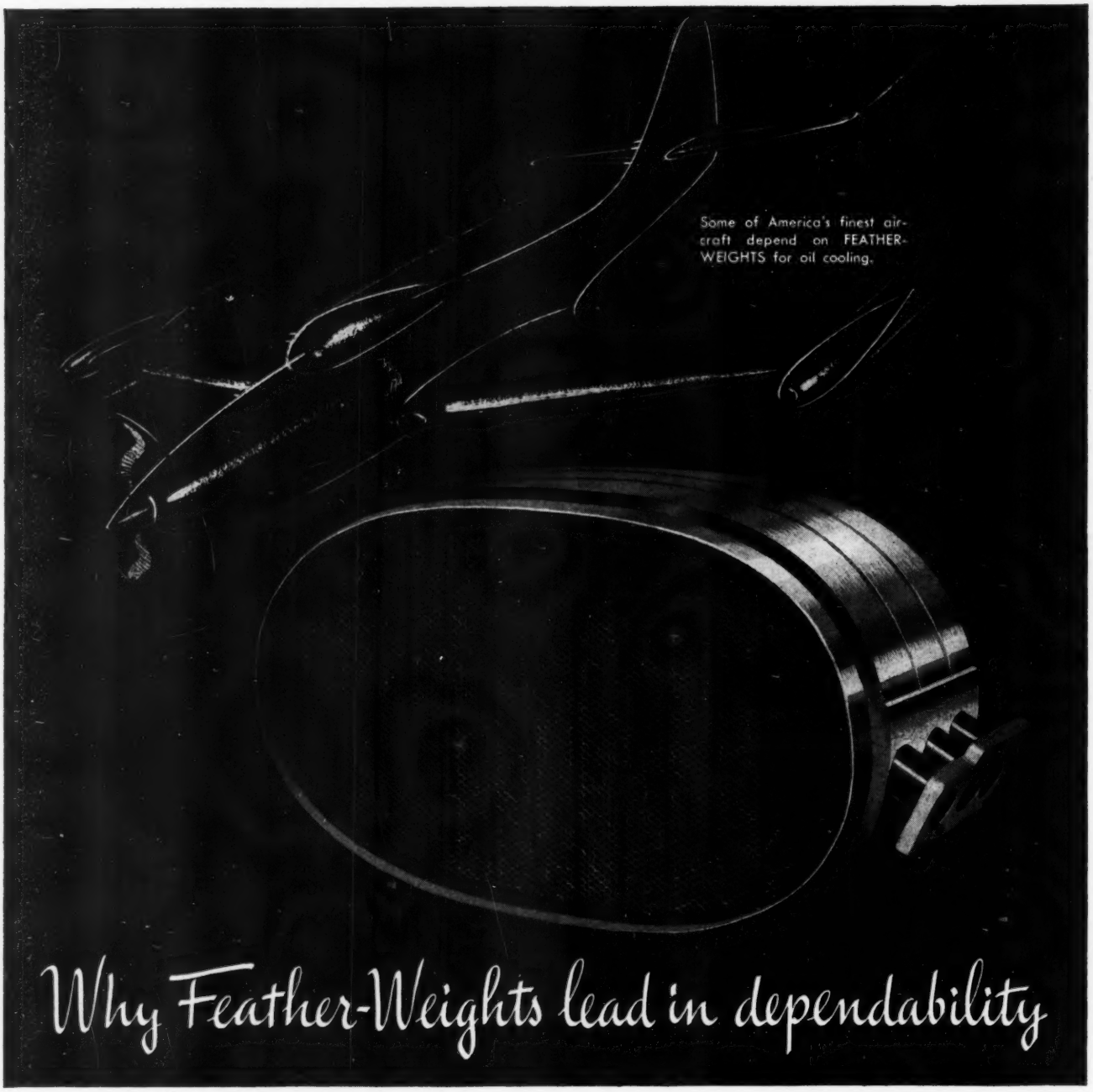

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More Papers Briefed from IAS Sessions

These digests continue AVIATION WEEK'S *presentation of subjects discussed at the 17th Annual Meeting of the Institute of the Aeronautical Sciences in New York, Jan. 24-27, 1949. Other summaries appeared last week.*

Some of the papers will be presented in greater detail in future issues.

ROTATING WING AIRCRAFT

Preliminary Development of a Jet-Propelled Helicopter – Roy E. Marquardt, President and Chief Engineer, and William E. Davis III, Project Engineer and Chief Test Pilot, Marquardt Aircraft Co.

This theoretical analysis compares ramjet, pulse jet and compressor-burner jet helicopters with conventional machines. The ramjet copter is not considered competitive. Pulse and compressor jet types have about the same performance and are superior in load-carrying capacity to conventional machine for endurances up to about 2 hr.

Details are afforded on the Marquardt M-14 pulse jet helicopter, its preliminary flight tests and attendant problems.

INSTRUMENTS

Pfund Sky Compass–Joseph B. Mathews, Jr., Head, Navigation Branch, Airborne Equipment Division, Navy Bureau of Aeronautics.

This study gives details on conception, development, and principle of operation of an instrument for determining direction by polarized light from sky.

Advantage of this compass over other direction instruments is that it can be operated in polar regions during twilight with favorable weather. Tests of early models resulted in direction accuracies of approximately 1 deg. on the ground and 4 deg. in flight.

Sperry Zero Reader–S. Kellog, Engineering Department Head, Flight Instruments, and C. F. Fragola, Engineering Section Head, Electronics Development, Sperry Gyroscope Co.

Presentation deals with history, description, analysis, operational testing, and comparison of the Zero Reader with standard flight instruments.

AIRCRAFT DESIGN

Present Status of Research on Boundary-Layer Control–A. E. von Doenhoff and L. K. Loftin, Full Scale Research Division, Langley Memorial Aeronautical Laboratory, NACA.

Survey of present status of research on boundary-layer control considers these possible applications: Reduction of profile drag by the elimination of turbulent separation and by increasing the relative extent of laminar flow; the increase of the maximum lift coefficient through control of laminar and turbulent separation; and improvement of airfoil characteristics at supercritical Mach numbers by controlling separation following the shock.

Possible improvements in airplane characteristics resulting from these applications of boundary-layer control are outlined along with general lines of future research.

CLOUD PHYSICS

Methods and Techniques for the Study of Atmospheric Nuclei, Clouds and Precipitation–Vincent J. Schaefer, Research Laboratory, General Electric Co.

End result of this research in Project Cirrus (joint operation of Air Force, Navy and Signal Corps.) is attempt to reach better understanding of various physical processes that combine genesis, growth, maturity and decline of clouds, and particularly, basic features combining to form various features of precipitation.

Highlighted are purely exploratory techniques teamed with tested and approved procedures in experimental meteorological studies conducted by research and flight operations groups.

Larger Scale Seeding of Stratus and Cumulus Clouds with Dry Ice–Irving Langmuir, Associate Director, Research Laboratory, General Electric Co.

Analysis gives data from 5 of the 56 flights made under Project Cirrus in photo-panel-equipped B-17s to obtain information on processes involved in production of rain and snow and to study modifications produced by artificial seeding.

Experiments on the Artificial Production of Precipitation at Wilmington, Ohio, 1948–R. D. Coons, R. C. Gentry, E. L. Jones, and Ross Gunn, Physical Research Division, U. S. Weather Bureau.

Summarized are results of nearly 150 independent experiments made to determine, in measurable terms, practicable limits and economic importance of cloud modification processes in producing precipitation and increasing the visibility for operating aircraft.

FLIGHT PROPULSION

Some Problems Concerning the Three-Dimensional Flow in Axial Turbomachines–Frank E. Marble, Instructor in Aeronautics, Guggenheim Aeronautical Laboratory, California Institute of Technology.

A simplified analysis of three-dimensional flow in neighborhood of stationary or rotating blade row is applied to these problems: (1) Estimation of mutual interference of adjacent and neighboring blade rows in a multistage axial turbomachine, and (2) flow in axial machine operating at conditions differing from those of the design.

Solution for entire flow field is given for machine having concentric cylinders for inner and outer boundaries, and particularly simple solution follows for a stage embedded in an infinite number of similar stages.

Consideration of operation at conditions other than design condition involves solution of "direct problem"–one where blade geometry rather than blade loading is prescribed. Problem is reduced to solution of an ordinary differential equation by linearization and by satisfying boundary condition only at trailing edge of the given blade row.

Aerodynamic Hysteresis as a Factor in Critical Flutter Speed of Compressor Blades at Stalling Conditions–A. Mendelson, Lewis Flight Propulsion Laboratory, NACA.

In study of flutter of compressor and turbine blades, assumption was made that absolute magnitudes of oscillatory aerodynamic forces and moments are same at stall as at zero angle of attack but that vector magnitudes of these forces and moments are changed, latter condition being caused by lag of aerodynamic damping and restoring forces behind the velocities and displacements at stall, thus giving rise to hysteresis effect. Decrease of critical flutter speed at stall was thus theoretically shown.

Results were applied to given airfoil, and correlation of experimental and theoretical results was found possible by assuming that angle of aerodynamic lag varies as slope of static-lift curve. Lag caused effective torsional damping to decrease, thereby explaining low values of torsional aerodynamic damping obtained at stall.

UPPER ATMOSPHERE

Solar Activity and the Earth's Atmosphere – Donald H. Menzel, Associate Director for Solar Research, Harvard College Observatory.

Electromagnetic portion of solar energy can be subdivided into a number of regions, according to wave length or frequency. From standpoint of terrestrial effects, far ultraviolet and soft X-ray regions are most important. If the

sun radiated energy like black body at temperature of 6,000 deg., amount of radiation to violet of about 1,500 A would be almost negligible. However, solar prominences and solar corona possess temperatures ranging from 25,000 to more than 1,000,000 deg. Theoretical study indicates that these regions give off considerable energy in the far ultraviolet in form of emission lines. These radiations are primary ones responsible for ionosphere, ozone, and heating of upper atmospheric layers.

Probing The Upper Atmosphere with Meteors—Fred L. Whipple, Associate Professor of Astronomy, Harvard College Observatory.

This paper concerns research on the upper atmosphere and high-velocity ballistics by means of photographic observations of meteors from two stations. Included are brief descriptions of general techniques, stations set up in New Mexico and Super-Schmidt camera.

Results cover determination of seasonal effect in upper-atmosphere densities, atmospheric density curve to 90 km. and certain ballistic results.

Special attention is given to problem of extensive ionized region accompanying many meteors observed by radio techniques.

Upper Atmospheric Measurements by Means of Large Rockets—T. A. Bergstralh, Physicist, Rocket-Sounding Research Section, Naval Research Laboratory.

Upper atmosphere investigations have been carried out in several fields in a period of over 2 yr. Accurate ambient pressures were determined up to 70 km., and somewhat less accurate measurements up to 120 km. Ambient temperatures were determined from variation of pressure with altitude and from ram pressure measurements.

Cosmic-ray measurements were made via Geiger counter tube telescopes and cloud chambers. Vertical distribution of ozone was determined from spectra obtained by flying solar spectrographs in the rockets. Rough measurements of effective electron densities were obtained.

The Navy Has a Skyhook—E. G. Droessler, Meteorologist, Geophysics Branch, Office of Naval Research.

Comparatively successful plastic balloon has been developed and is being utilized in broad program of upper atmosphere research. In 52 flights, heavy loads have been carried to altitudes exceeding 30 km. Scientific instruments are carried aloft to collect new information on cosmic rays, biological phenomena, meteorological parameters, etc.

FLUID MECHANICS

Two-Dimensional Jet Mixing of a Compressible Fluid—S. I. Pai, Cornell Aeronautical Laboratory, Inc.

Mixing and divergence of supersonic jet exhausting into a supersonic stream are investigated theoretically. Initially, flow is assumed to be laminar. If velocity in jet differs slightly from that of surrounding stream, using the method of small perturbations and ordinary boundary layer assumptions, the equation of motion of two-dimensional flow reduces to the form of the equation of heat conduction whose solution is known for any given boundary conditions.

By transformation simliar to that used by Von Karman and Tsien, exact solution of the two-dimensional jet mixing of a viscous compressible fluid can be obtained by successive approximations, starting with solution obtained from method of small perturbations.

Cases of turbulent flow are also investigated by means of Reichardt's theory of free turbulence.

Some Recent Measurements in a Two-Dimensional Turbulent Channel—John Laufer, California Institute of Technology.

Examined are detailed measurements of mean and turbulent velocity fields in two-dimensional, fully developed turbulent channel flow, including distributions of velocity fluctuations, correlation coefficients, turbulent scales and micro-scales. Afforded are results of measurements in laminar sublayer and Reynolds number effects on turbulent velocity field. Distribution of various turbulent energy terms across the channel is also obtained.

STRUCTURES

Study of Bending-Torsion Aero-Elastic Modes for Aircraft Wings—Martin Goland, Chairman, Engineering Mechanics Division, and Yudell L. Luke, Research Mathematician, Midwest Research Institute.

Manner of arriving at stability determinant for natural motions of bending vs. torsion aero-elastic system is outlined. This permits determination of characteristics of natural modes of the system at any chosen airspeed. Damping in critical mode increases with airspeed until at least 85 percent of critical speed is attained; it then rapidly decreases to the flutter value of zero. Non-critical mode encounters sharp increase in stability in proximity of flutter.

Comparison is also made between normal mode characteristics and system response due to forced excitation. Latter usually affords an earlier indication of approach to a critical state. From this it appears that flight-flutter testing is best carried out using the forced vibration technique.

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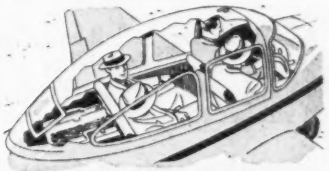

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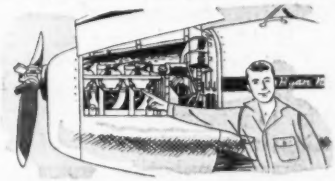


NEW MECHANICAL REFINEMENTS!
Many new and exclusive refinements... more and still better standard equipment ...place the *Ryan Navion* in a class with the *most modern* commercial airliners. Now you can fly your *Ryan Navion* with even greater confidence.

NEW STREAMLINED BEAUTY!
Inside and out, the new *Ryan Navion* is exciting! More performance; more comfort; more features for still greater owner confidence and satisfaction. You'll agree "It's *Navion* Again" when you check all 29 new advancements for '49. Send today for colorful, free brochure giving complete details of the 1949 *Ryan Navion*.

NO OTHER PLANE COMBINES SO MANY FEATURES SO WELL

Ryan Navion

Rely on Ryan RYAN AERONAUTICAL COMPANY, 42 LINDBERGH FIELD, SAN DIEGO 12, CALIFORNIA

stable Skidding Friction—J. E. Wignot, Structures Engineer, and Frederic M. Hoblit, Stress Engineer, Lockheed Aircraft Corp.

This study shows, theoretically, that unstable (self-excited) skidding oscillations of landing gear may occur under service conditions. Primary requirement for such oscillations is that coefficient of sliding friction between tire and runway decrease with increasing skidding velocity. Such variation ordinarily exists for rubber tire on wet pavement.

Consideration is influence of other variables on initial stability of oscillations and maximum amplitudes, loads, and stresses that may be reached.

Compression Tests of Curved Panels with Circular Hole Reinforced with Circular Doubler Plates—Wilhelmina D. Kroll, Aeronautical Engineer, A. E. McPherson, Materials Engineer, National Bureau of Standards.

Studies were made with and without circular reinforcement of 3-in. central hole in 14 curved sheet panels, 14-in. long, 24 in. wide, and 0.188 in. thick, with radius of curvature ranging from 10 in. to infinity.

Conclusion is that effect of curvature on strain distribution around hole is negligible, and is disclosed that circular reinforcement attached with one row of rivets did not appreciably reduce strain near hole.

Strain distribution calculated from plane stress theory agrees closely with that observed for panels with unreinforced holes. For reinforced panels, observed strains were higher in reinforced area of sheet and lower in the reinforcement than strain calculated from the plane stress theory.

Numerical Procedure for the Stress Analysis of Stiffened Shells—Dr. John E. Duberg, Structures Research Division, Langley Aeronautical Laboratory, NACA.

Procedure is based on usual assumption of shell stress analysis that shape of the cross section is maintained by stiff bulkheads. Method is general enough to include effects of cut-outs as well as secondary effects due to restrained warping usually referred to as shear lag when the shell is loaded primarily in bending, and bending stresses due to torsion when the shell is loaded primarily in torsion.

Quantities determined directly are spanwise distribution of axial displacements, and relative rotations and displacements of the cross sections. Numerical equations defining these quantities are solved by method of simple iteration.

Details of procedure's application to a simple problem are given, and results obtained from a more complex problem are summarized.

HUMAN ENGINEERING

Display Problems in the Use of the Omni-Directional Range Instrument—A. C. Williams, Jr. and Stanley Roscoe, Dept. of Psychology, University of Illinois.

Speed and accuracy with which 48 pilots (16 non-instrument, 16 commercial with instrument rating, and 16 scheduled-airline) could use mockups of eight different VOR aircraft instrument displays to solve typical navigation problems were measured. Instrument and airline pilots made fewer errors than non-instrument pilots but there was no significant difference in time scores.

So-called pictorial displays giving information in terms of graphic representation of actual spatial relations involved were significantly superior to so-called symbolic displays presenting information in terms of dial readings, needle deflections and numbers. One pictorial display was found to be superior to all others.

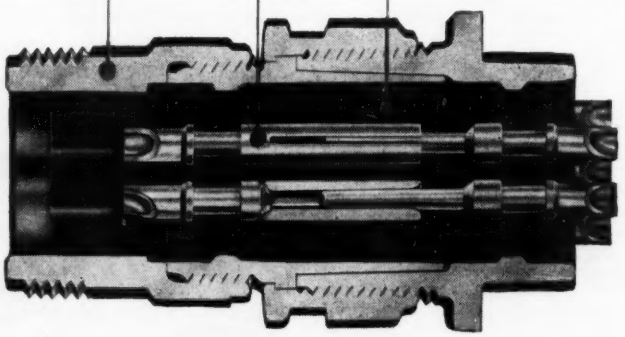
Reliability of techniques used was inferred to be adequate from measures of internal consistency and from similarity of results obtained from independent groups.

JUST LOOK AT THESE FEATURES →

SHELL
High strength aluminum alloy . . . High resistance to corrosion . . . with surface finish.

CONTACTS
High current capacity . . . Practically no voltage drop. No additional solder required.

SCINFLEX ONE-PIECE INSERT
High dielectric strength . . . High insulation resistance.



BENDIX-SCINTILLA

ELECTRICAL CONNECTORS

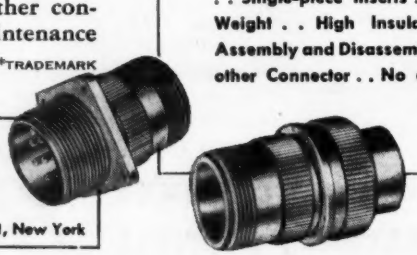
the Finest money can buy!

Contacts that carry maximum currents with a minimum voltage drop are only part of the many new advantages you get with Bendix-Scintilla* Electrical Connectors. The use of "Scinflex" dielectric material, an exclusive new Bendix-Scintilla development of outstanding stability, increases resistance to flashover and creepage. In temperature extremes, from −67° F. to +300° F., performance is remarkable. Dielectric strength is never less than 300 volts per mil. Bendix-Scintilla Connectors have fewer parts than any other connector on the market—and that means lower maintenance costs and better performance.

*TRADEMARK

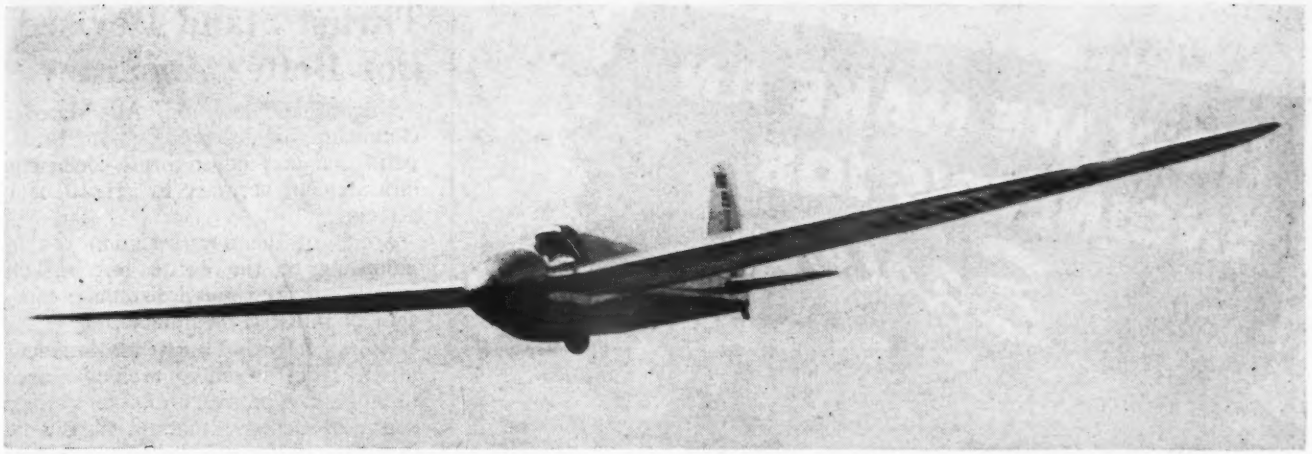
CHECK THESE OTHER ADVANTAGES

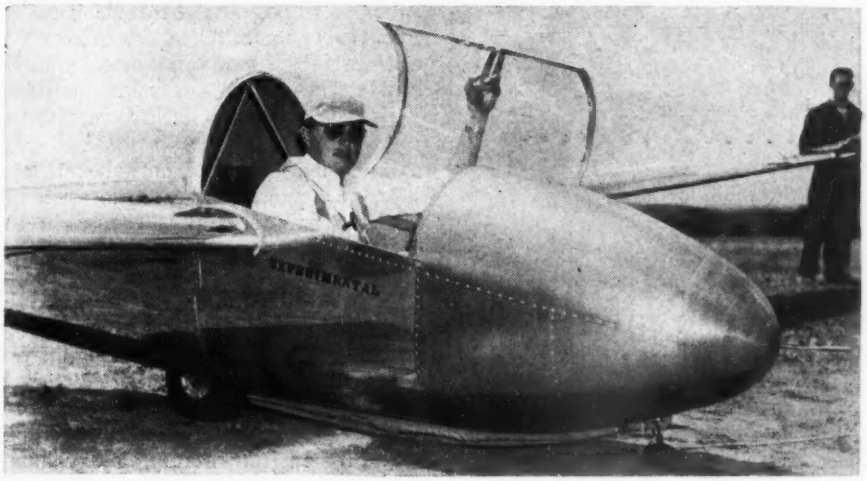
Moisture-proof . . Pressure-tight . . Radio Quiet . . Single-piece Inserts . . Vibration-proof . . Light Weight . . High Insulation Resistance . . Easy Assembly and Disassembly . . Fewer Parts than any other Connector . . No additional solder required



WRITE DIRECT TO THE SALES DEPARTMEMT

SCINTILLA MAGNETO DIVISION of BENDIX AVIATION CORPORATION
SCINTILLA
SIDNEY, NEW YORK
Export Sales: Bendix International Division, 72 Fifth Avenue, New York 11, New York





Schweizer 1-23—Basic Data

Span	43 ft. 10 in.
Length	20 ft. 4 in.
Height	6 ft. 10 in.
Aspect Ratio	12.88
Wing Area	149 sq. ft.
Empty Weight	358 lb.
Useful Load	242 lb.
Gross Weight	600 lb.
Wing Loading	4.02 lb./sq. ft.
Minimum Sinking Speed	2.60 ft./sec.
Maximum L/D	24.60
Cruising Speed	75 mph.
Placard Dive Speed	110 mph.
Design Max. Glide Speed	123 mph.

Schweizer's All-Metal Sailplane

Production plans for 1-23, developed from craft that won national championship, marks rebirth of industry.

Quantity production of its new Model 1-23 high-performance sailplane is planned by Schweizer Aircraft Corp., Elmira, N. Y. The all-metal, single-seater is priced at $2195 and will be manufactured in production runs of 20 ships, beginning early this year.

The new model was developed from the 1-21, which won the national championship in 1947, and the prototype has already been put through rigorous flight trials.

► **Flown by Champs**—It was the subject of a "test flight clinic" in which the leading sailplane pilots of the country tried out the craft and made recommendations.

Among those who flew the new ship were four national soaring champions—Paul MacCready, New Haven, Conn., 1948 champion; Dick Comey, Weston, Mass., 1947 winner; John Robinson, Pasadena, Calif., 1940, '41 and '46 champion; and Emil Lehecka, New York winner in 1938.

► **Design Factors**—Fuselage, wing and empennage skin plating is 24ST Alclad. Spar fittings are of 75ST alloy for extremely high strength.

Even with this truly all-metal construction, however, the 1-23 weighs only 358 lb. empty. The ship was designed as a Class I sailplane with a design speed of 123 mph. and a minimum design load factor of 8.34, an exceptionally high figure.

With provision for 190-lb. pilot and 52 lb. of equipment, the 1-23 has a gross weight of 600 lb., giving it a wing loading of slightly more than 4 lb. per sq. ft.

► **Cockpit Equipment Details**—The metal construction permits added roominess to the cockpit because of the elimination of large frames and internal structure common to wooden sailplanes.

The canopy is molded Lucite to fit the contours of the fuselage, providing minimum drag.

Area behind the pilot may be used for radio, barograph or oxygen.

► **Almost Mile-a-Minute**—Design of the 1-23 began in 1947, but construction of the prototype did not start until May, 1948. The ship was completed last July 4, in time to participate in the 15th National Soaring Contest.

Flight characteristics of the 1-23 are said to be excellent. It is claimed to be very stable at the stall and must be forced into a spin from which it will recover with rudder.

It is equipped with a set of spoiler panels for glide control, the control being linked with the wheel brake. A single wheel landing gear is used with rubber-mounted skid forward of the wheel and a small rubber tailwheel aft.

► **Effect of Surplus**—Announcement of Schweizer production plans is one of the early indications that the soaring situation is finally recovering from the deluge of surplus military gliders.

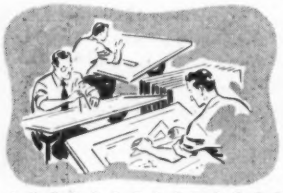
Although this situation made nearly fatal inroads on the production industry, it provided a tremendous impetus to the gliding sport by expanding the number of ships and pilots many, many times in a few short months.

The surplus gliders, however, were designed for military operations and thus are much heavier and of consequent impaired performance.

As a result, the industry is confident that the deluge will prove a blessing in disguise through creating a much larger demand for high performance sailplanes than would normally have existed.

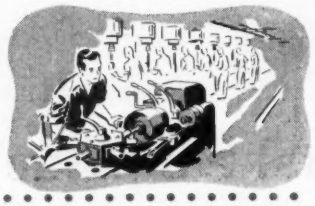
HOW WE MAKE AN ENGINEER'S JOB *Easier:*

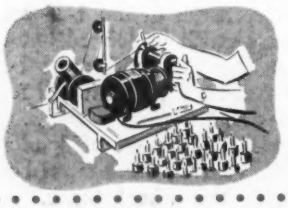
First ... **WE WORK WITH YOU** in solving your valve problems. Our sales-engineers meet with your engineers to discuss your valve requirements. Plans, sketches and estimates are developed on the job to show you how WHITTAKER valves may be profitably used in your installation.



Second ... **WE SPECIALIZE** in the design and engineering of all types of aircraft valves. We have pioneered and perfected more than 175 different valves for the aircraft industry. Our staff of design and research engineers apply these time-tested, flight-proven designs to your valve requirements.

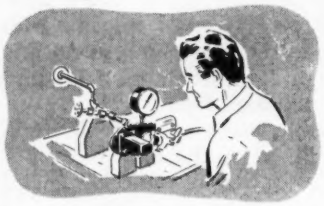
Third ... **WE EMPLOY** only the highest quality materials and precision workmanship for the production of our valve bodies. Our special machines and advanced manufacturing techniques provide mass production economy, and insure the same precision machining of each valve body.





Fourth ... **WE MAKE OUR** own actuators for our motor-operated valves. Our actuators are designed and engineered to fit your particular need. We are not dependent on outside sources of supply. Our actuators are built to meet specific requirements of the valve, instead of designing the valve to fit the actuator.

Fifth ... **WE FULLY TEST** our valves at every stage of manufacture. Before leaving our factory, all valves are performance-tested according to the service to which they are to be put. Our valves are tested under actual operating conditions for strength, leakproof closures, smoothness of operation—your assurance that they will do the job for which they were designed.



Next time, make your engineer's job easier by bringing your valve problems to WHITTAKER—the only manufacturer offering a completely integrated service from original design to final installation and servicing. Contact our Engineering-Sales Department. WM. R. WHITTAKER CO., LTD., 915 North Citrus Avenue, Los Angeles 38, California.

Whittaker

First IN DESIGN

First IN PERFORMANCE

First WITH VALVES THAT ARE FIRST CHOICE IN INDUSTRY

Thrust Stand Devised For Better Accuracy

Flight Test Division, Air Materiel Command, has developed a static thrust stand that may boost thrust coefficient measurement accuracy to ±1/10 of 1 percent.

Secret of the new precision lies in mounting of the entire test rig on scales so slightest non-horizontal component of thrust is measurable.

▶ **Rake Method**—Thrust measurement in flight has presented problems since turbojets first became airborne. Earliest and most successful method was the use of pressure "rakes" (a series of tiny tubes projecting at right angles from a main tube) mounted in the tailpipe of a jet engine. These tubes measure total and static pressure, calculations from which produce the static thrust value of the engine.

This method is not entirely satisfactory, mechanically, because location of the rake in the tailpipe exposes it to high temperatures that often burn the installation. Also, vibration of the tailpipe frequently forces the rake loose to cause loss in flight. And the rake requires use of numerous recording instruments in the plane or telemetering equipment for ground recording.

AMC sought a standardized method of thrust instrumentation and calibration so that all airframe manufacturers could incorporate the system in planes while still at the factory.

Research indicated that any one engine of a given type can be used to calibrate all tailpipes used for a particular type of aircraft within an accuracy of ±3%. However, such calibration does not provide sufficient information on duct or installation losses.

▶ **New Setup**—To solve the problem, AMC has constructed a diamond-shaped platform mounted on four elastic columns and carrying a Cox & Stevens weighing cell to indicate horizontal static thrust of the engine-airplane combination. In addition, four C & S weighing cells are used to measure the exact weight of the plane.

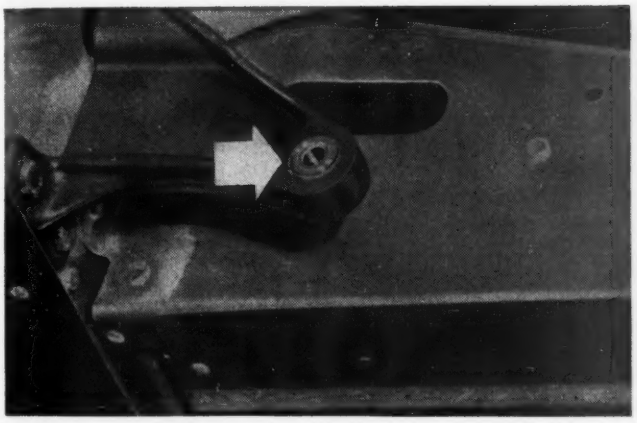
The pilot enters the airplane mounted on the platform and prepares the engine for takeoff. At this moment the exact weight of the craft is measured.

The engine is then accelerated and simulated maneuvers performed while weight measurements of the vertical and horizontal components of the thrust and weight are taken. This permits a complete aircraft-engine calibration.

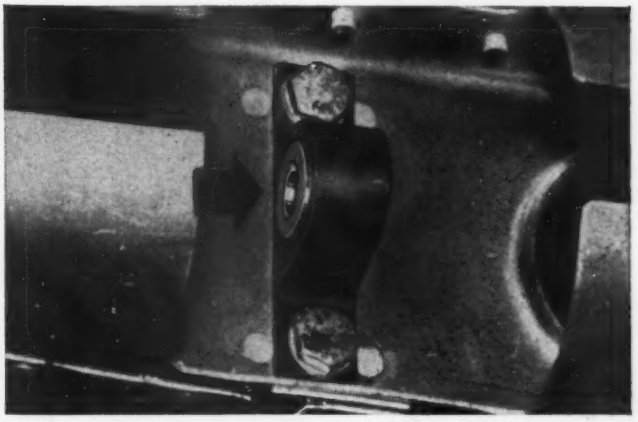
The present stand can accommodate fighter aircraft weighing up to 50,000 lb. and delivering as much as 32,000 lb. thrust. If the test program proves successful, larger platforms can be built for jet bombers.

"We Get Smoother Controls and Lighter Construction with Torrington Needle Bearings,"

say Cessna Engineers

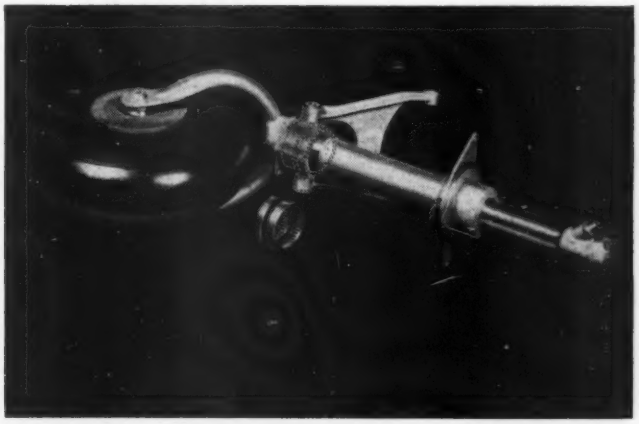


Keeping always as a goal top performance and low operating costs, engineers of Cessna Aircraft Company have spent months testing every part for safety and dependability. Extremely lightweight design with extra sturdiness called for Type AR Torrington Needle Bearings in such applications as the aileron hinge.



Exemplifying compact design is this close-up of one of the elevator hinges in the Cessna Model 190. "Here, as in the bell cranks, push-pull tubes and aileron hinges, Type AR Needle Bearings provide the ease and feel of operation so desirable in all aircraft manual control devices," states Tom Salter, Cessna's chief engineer.

"Torrington Needle Bearings also reduce friction in the control column to so low a coefficient that their use virtually eliminates wear," Mr. Salter continues. "The unit Needle Bearing AR assembly with retained inner race, permits prelubrication that lasts the ordinary service life of the plane."



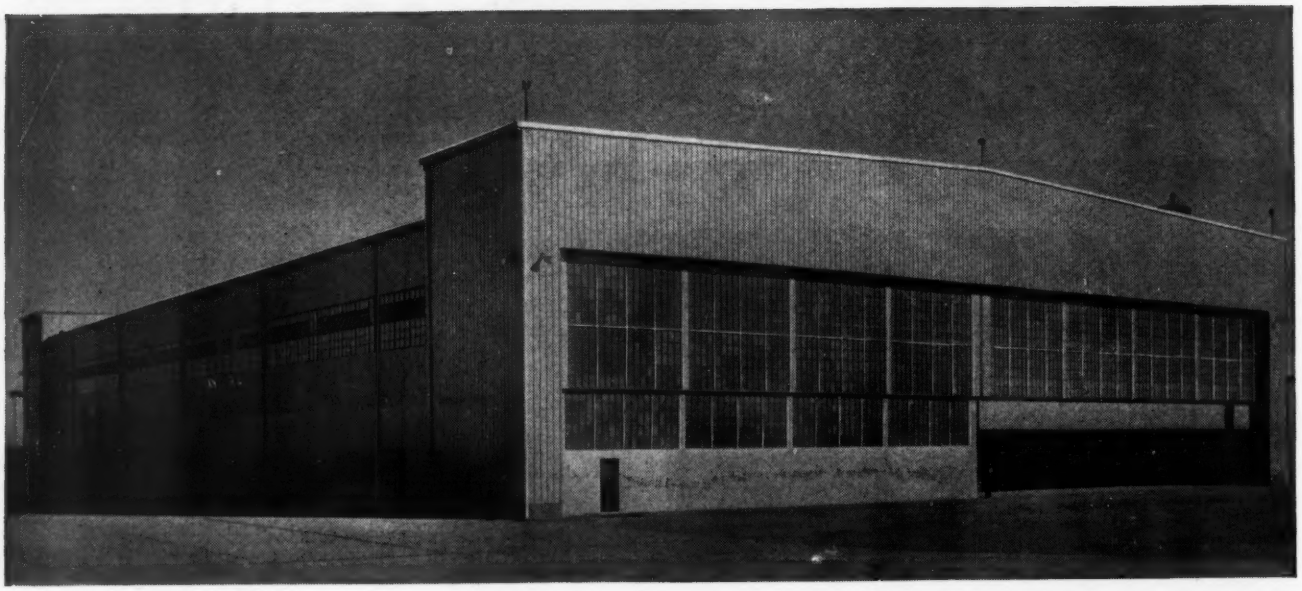
Where loads are largely static, as in the tail wheel, above, the full complement of hardened rollers offers maximum bearing contact surface, and ample lubricant reserve to assure good lubrication. Torrington Type DC Needle Bearings provide high radial capacity, and easily handle the shock loads of landing.

The high capacity, small size and anti-friction efficiency of Torrington Needle Bearings can be used to improve your product, too. For complete engineering service, call or write the nearest Torrington office. THE TORRINGTON COMPANY, Torrington, Conn., South Bend 21, Ind. District Offices and Distributors in Principal Cities.

TORRINGTON *NEEDLE* **BEARINGS**

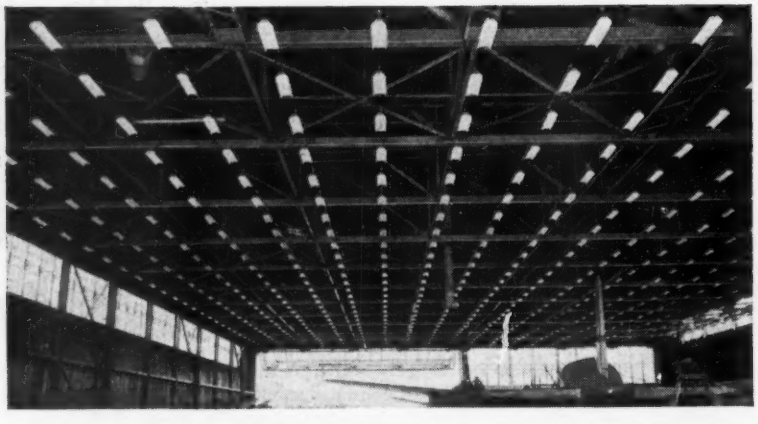
Needle • Spherical Roller • Straight Roller Tapered Roller • Ball • Needle Rollers

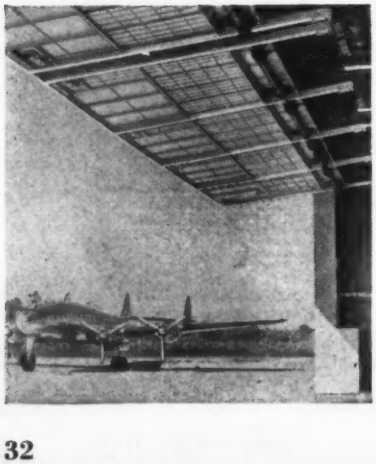
TRUSCON PLANNING BOARD



ABOVE. Truscon, world's largest manufacturer of steel building products, supplied the structural steel, Ferroplate Siding, Ferrobord Steeldeck Roof, Pivoted Steel Windows with Mechanical Operators, and electrically operated Vertical Lift Canopy Doors, for this Lockheed Hangar Building, MacArthur Field, Long Island, New York. Practically your entire steel building products needs can be supplied by Truscon—see SWEET'S Catalog, or write for complete literature.

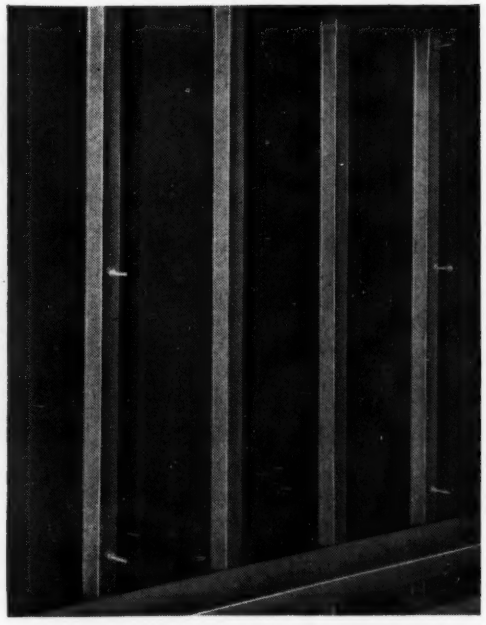
Lockheed Hangar Building Illustrates Wide Scope of Truscon Steel Building Product Service





ABOVE. A view of the Truscon Structural Steel in the Lockheed Hangar, with the Ferrobord Steeldeck Roof above it, and the Pivoted Steel Windows, mechanically operated, at the left. Write for complete illustrated literature on these products.

AT LEFT. One of the electrically operated Truscon Braced Vertical Lift Canopy Doors installed in the Lockheed Building. Truscon can supply efficient steel doors for any type or size of hangar installation. Write for illustrated literature describing the entire Truscon line.



ABOVE. Detail view of the Truscon Ferroplate Siding, an innovation in hangar building construction. Offers the advantages of economy, quick construction, rigidity, future application of insulation, and many other desirable features. Write for complete detailed description of this new industrial steel siding material.

Lockheed Hangar Building, MacArthur Field, Long Island, New York. Lowe Construction Company, Contractors; Clarkson & Petrov, Architects.

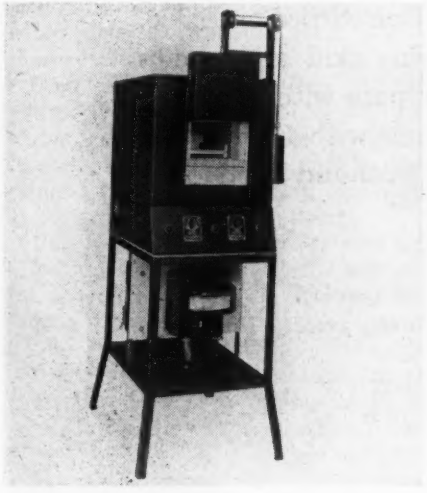
TRUSCON STEEL COMPANY

YOUNGSTOWN 1, OHIO • *Subsidiary of Republic Steel Corporation*

NEW AVIATION PRODUCTS

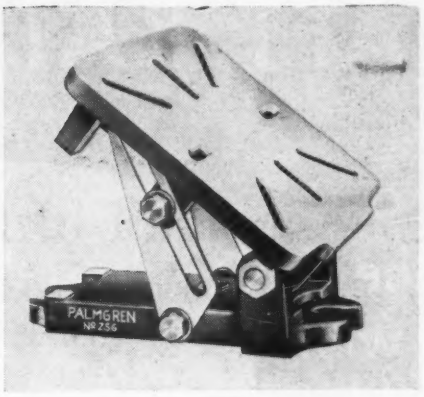
Handy Sprayer

Compact, portable sprayer for small industrial paint jobs is offered by **Sellco Corp.**, 815 Andrus Bldg., of Minneapolis 2, Minn. Completely self-contained, unit operates with built-in compressor, eliminating need for hose or separate motor. Total weight is 4 lb., including nonbreakable quart container. Enclosed motor operates from 110v. a.c. or d.c., at speed of 10,000 rpm., producing over 50 lb. pressure. Interchangeable nozzles provide cone or fan shape spray pattern. Diecast parts are few, simple and accessible for easy cleaning. Pistol grip, trigger control, and general balance afford easy handling.



For Heat Work

Designed specifically for tool and die work, hardening and drawing, new floor model electric furnace, offered by **K. H. Huppert Co.**, 6830 Cottage Grove Ave., Chicago 37, Ill., has temperature range of 100 to 2000 F. Temperature control is achieved by stepless input controllers, integrally mounted. Furnace has two sets of heating elements, top and bottom comprising one set, two sides making up other element. It's reported that temperatures as low as 100 F. can be controlled with same accuracy as higher temperatures in ordinary furnaces. Inside dimensions are 8 in. wide, 6 in. high, and 12 in. deep. Overall dimensions are 24 in. wide, 29 in. deep and 68 in. high. Standard operation is on 220v., single phase, but 110v. models are also available.

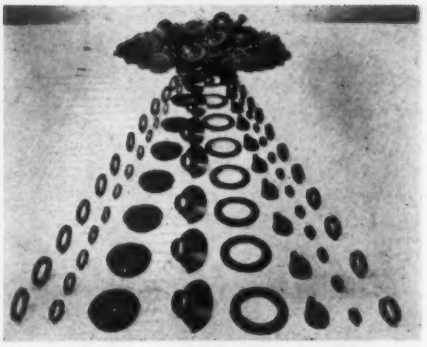


Machine Shop Aid

For quick, easy setups of jobs difficult to hold in vise, adjustable angle plates made by **Chicago Tool and Engineering Co.**, 8383 S. Chicago Ave., Chicago 17, Ill., are offered for drilling, milling, grinding, layout, inspection, and other jobs which would ordinarily require special arrangements. Bases are provided with bolt lugs for fixing angle plate to machine table, and eight bolt slots are provided on surface plate for holding work. Adjustment is to full 90 deg. and graduations are given for all angles. Unit is ready for instant use by locking support screws. Plates are available in two sizes, 6×6 in. and 9×9 in.

For Cargo Tie-Down

"Load-Set WebLock" for safely securing loads for transportation, is announced by **Pacific Airmotive Corp.**, Burbank, Calif. Device can be pulled to desired tension within limits of operator, with no backlash. It provides mechanical advantage of 2 to 1, and is reported to offer advantages of saving in handling time, elimination of cargo breakage, and safety of delicate loads through control of tension. Webbing is available with end fittings to accommodate rings, hooks or bars.



Petroleum-Resistant Rubbers

Synthetic rubber compounds, Buna N., Hycar or Neoprene-based, developed especially to resist action of petroleum products, are offered by **Stalwart Rubber Co.**, 179 Northfield Road, Bedford, Ohio, for fabrication into gaskets, sleeves, washers, tubing, molded products, and extruded cross sections for application in fuel lines, dust covers, filters, channels, vibration dampeners, etc. Reported to have long life and minimum swell under adverse conditions, these rubbers can be supplied with tensile strength from 500 to 2500 psi., durometer hardness from 40 to 90, and elongations from 100 to 600 percent. Various oxidant additives will provide weatherproof qualities. Products are stated to withstand temperatures ranging from −60 to 225 F.

Die Transfer Table

For transferring dies from press having extended base, die handling table has overhanging top counterweighted to provide proper balance when handling dies weighing up to 300 lb. Unit is made by **Lyon-Raymond Corp.**, 7259 Madison St., Greene, N. Y. Overhanging section, 14×24 in., serves to bridge gap caused by press base extension, and for extra safety, retaining bars are provided on three sides of table. Hydraulic elevation is from 28 in. (low position) to 44 in. (high position). Unit has 30×30-in. main top, single speed foot pump, floor lock type brake, two 5-in.-dia. swivel casters, and two 5-in.-dia. rigid casters.

Exide®

AIRCRAFT BATTERIES

Serve the skyways with dependable power

Exide Aircraft Batteries supply dependable power for every type of aircraft service. In 1917, the first battery equipped plane carried an Exide. Since then Exide engineering skill and manufacturing ability have kept pace with the rapid strides of aviation . . . serving with batteries of dependability, long life, economy and low-cost maintenance.

Write for copy of Exide Aircraft Catalog, which includes the Exide Battery price and replacement data sheet.

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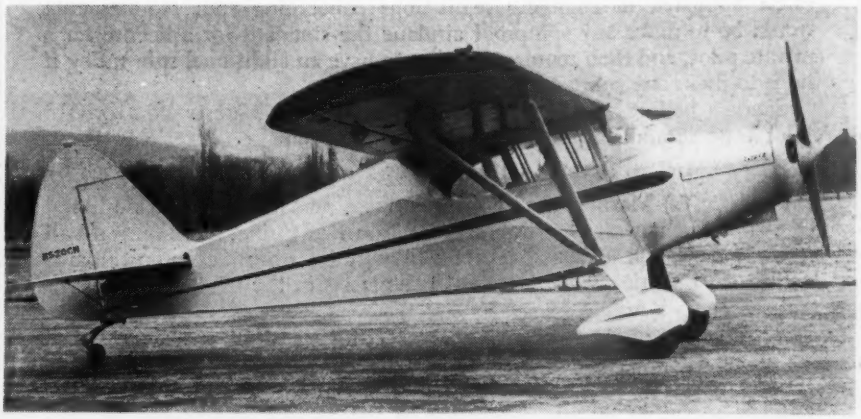
THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32 • *Exide Batteries of Canada, Limited, Toronto*

SALES & SERVICE



With this four-place Piper Clipper, price-tagged at $2995, the Lock Haven manufacturer is making an early move to dominate the growing four-place field. Although it is the lowest-priced plane its size, it greatly resembles the Piper-Stinson Voyager.

Lightplane Trend to Four-placers

More than half of 6969 deliveries in 1948 are of four-passenger type; farm and business use increasing.

Personal plane manufacturers delivered 6969 airplanes in 1948, with a total dollar value of $27,906,000 (at manufacturers' net billing price).

Back to prewar production levels on a numerical basis, the year's shipments indicated a continuing rising trend toward four-place airplanes with greater utility for business and agricultural uses. More than half of the total (3565) shipped were of this class.

► **Used Plane Effect**—Effect of the glutted used plane market on new two-place plane sales contributed seriously to shrinking their volume, until in December, only 62 two-placers were sold as compared to 148 four-placers.

For the second successive year the Stinson Voyager (and its modification, the Stinson Flying Station Wagon) took honors for sales in a single model, with a total of 850 Voyager-Station Wagons delivered, (801 by Stinson division of Convair and 49 in December by Piper Aircraft Corp. which purchased the plane). Some indication of the total shrinkage of the market is seen from the fact that in 1947 Stinson deliveries totalled 2662.

► **Sales Comparison**—Total sales in 1948 were only 44.9 percent in numbers of the personal plane deliveries in 1947. The higher unit cost of the 1948 planes ran the dollar volume up to just above the 50 percent mark in relation to the dollar volume of 1947.

Compared to the peak year of 1946 when personal plane makers cashed in on pentup war's-end demands, the 1948 deliveries had shrunk to 20.9 percent numerically, and 30 percent dollar-wise.

► **Business Users**—At the beginning of 1949 two factors seem struggling to turn the tide of personal plane sales—perhaps down—perhaps up. The first is the slowly growing appreciation of 2700 American business firm airplane users that today's four-placers have some real uses in business. The second is the continuing trend of the personal plane manufacturers to price their planes higher and farther out of the reach of the consumer.

Fully conscious of the larger market potential awaiting a lower-priced plane, William T. Piper, Sr., head of the company bearing his name, took a long step in the opposite direction from the rising price trend when he announced a new $2995 four-placer, the Clipper. Whether any of the other manufacturers will contest this low-priced field with him seriously, has not yet been indicated. On a basis of last year's prices however, the nearest competitors were the Piper Family Cruiser at $3825 and the Aeronca Sedan at $4795.

► **Sales Fight**—Hottest volume sales competition for 1949 promises to be between Cessna, 1948's volume leader and Piper, the runner up. Piper's acquisition of Stinson has strengthened that company's position for 1949, in adding good distributors and dealers as well as in adding a popular airplane to the Piper line, and a considerable volume of replacement parts business from Stinson owners in the field.

On the basis of their high performance and high cost for four-place executive planes Beech and Ryan should again be closely competitive for a large portion of the total dollars spent in 1949 for civil aircraft.

► **Sales Tabulation**—Summarizing, the 1948 personal plane sales were allocated as follows:

Firm	Number	Dollars
Cessna	1631	$6,768,000
Piper	1479	3,083,000
Stinson	801	3,902,000
Luscombe	716	1,945,000
Beech	678	5,563,000
Aeronca	599	1,592,000
Ryan	483	3,289,000
TEMCO	252	808,000
Ercoupe	152	411,000
Taylorcraft	105	196,000
Bellanca	49	146,000
Republic Seabee	24	103,000

(Fairchild Engine & Airplane Corp. shipped 81 F-24 four-placers valued at $339,000 in 1948, but these were not included in the official 1948 totals of Personal Aircraft Council of Aircraft Industries Assn., official reporting agency, since the same airplanes had been previously reported when they were built by TEMCO and shipped to Fairchild.)

► **Four-Place Standing**—Cessna led in four-place shipments with 912. Other four-place deliveries reported: Stinson, 850; Beech 678; Ryan 483; Aeronca 306; Piper 192 (not counting 49 Stinsons delivered in December); Luscombe 71; Bellanca 49, and Republic 24.

Piper led in two-placer deliveries with 1092. Other two-placer shipments reported: Cessna 719; Luscombe 645; Aeronca 290; Swift 252; Ercoupe 152 and Taylorcraft 105.

Crop Dusting Code

Washington State Aviation Assn. has proposed a crop dusters' and sprayers' code setting up minimum standards of pilot experience, plane repair and financial responsibility for commercial operators in these fields.

"One shoestring duster with an $800 airplane, a bucket with holes punched in the bottom and a lot of unpaid bills can damage the entire legitimate crop dusting industry in this state," Robert N. Ward, executive secretary, said in announcing the code.

He said the association will ask the state director of agriculture to incorporate the code in a directive, thus giving it legal status so it could be enforced by state and county officers.

Ercoupe Can Be Made Roadable

A kit which permits conversion of a standard Ercoupe to a roadable model has been designed by Wismer Holland of South Georgia Flying Service, Valdosta, Georgia.

Shake-down flight was conducted recently when Holland flew to Miami's Browns Airport, paused briefly to stow the wings on top of the cabin, and chugged away at 30 mph. down the highway to Opa Locka Airfield, site of the Miami All American Air Maneuvers.

Wings can be readied for flight or detached and stowed on top by two people in 30 minutes, Holland reports. The sleeve-joint tubing is removed for flight by lifting off from a permanently installed pedestal attached at either side of the cabin. The wings attach to the center section by two bolts on each side—at the landing gear strut and the rear spar.

► **No Ground Cooling Problems**—Maximum length of any single ground trip in his roadable Ercoupe so far has been only 27 minutes, yet designer Holland expects no ground cooling problems. Oil temperatures have never exceeded 150 degrees, with engine operating at 850 rpm. producing ground speeds to 35 mph.

Eventually Holland hopes to have a conversion kit which he can market. First he plans additional tests, modifications and checking legal requirements that may restrict road travel. He wants to study cross-wind handling with the wings stowed overhead, and try a continuous circular guard for the propeller.

► **Ground Handling Aids**—Wing panels of the Ercoupe are easily detachable at a point just beyond the landing gear fittings. Simplicity of the Ercoupe's ground handling, stemming from its steerable nosewheel and separate footbrake, is another advantage leading toward roadability already provided in its design.

Bob Sanders, head of Sanders Aviation Inc., world Ercoupe distributors, reports that Holland has discussed the conversion with his organization but is conducting the development independently.

Sanders sees some problems yet to be solved in the development before the conversion would be marketable, but regards progress made by Holland thus far as quite promising. Among the problems:

- Most state highway requirements set a maximum width of vehicles at 8 ft. Tailspan of the double-tail fin Ercoupe is 8 ft. 3 in.
- Propeller guard as now designed does not adequately screen the whirling blade to prevent a person from falling into the propeller from the front.

BRIEFING FOR DEALERS & DISTRIBUTORS

MAKE SPINNERS EXCEPTIONS—A comment which makes sense but may be hard to sell to the aviation industry is the suggestion of Bob Sanders, head of the world Ercoupe distributor organization, that the safest approach in changing regulations concerning spin requirements would be to make any spinproof airplane the standard for a license for a private pilot, and then require the pilot to have an additional spin rating if he is to fly in any spinnable aircraft.

Sanders believes that proposed elimination of spin tests from private pilot tests should be accompanied by wingtip stall recovery instruction.

REDUCED RATE EXPERIMENT—Bernard Bellario, operator of Buffalo (N.Y.) Marine Airport, is planning a new reduced airplane rental rate experiment when he resumes operation this spring. He hopes it will bring him enough increased business to more than break even on the lowered cost. Bellario proposes to rent two-placers in the 65–85 hp. class for a flat 5 cents a mile.

This will average between $3.50 and $4 for solo time as against standard plane rates in his area of $8 to $8.50 an hour solo. For dual instruction he will merely add the instructor's flat fee of $3 an hour to the airplane rental, as is current practice on the $8 and $8.50 rates. At prevailing rates it costs approximately $370 in his area to get enough time for a private pilot license (10 hr. dual plus 30 hr. solo).

Bellario's plan would make the cost about $190. "I am convinced I can operate at these rates and make money. If I make a profit of a quarter of a cent a mile and have 30 persons flying, I will benefit more than if I clear 5 cents a mile and have only one plane in the air," the Buffalo operator says.

AEROMATIC SALES TOUR—Sid Fedan, manager of Aeromatic Propeller department of Koppers Co., Inc., has started three factory sales representatives, George Levis, Dick Andrew and Dick Rose, from Baltimore home office in company airplanes on a two months' national sales tour, in which new distributor agreements will be signed to replace former factory dealer agreements.

New plan calls for increased distributor discounts "with the majority of the increase borne by the factory." A new accessory for the Aeromatic propeller, a "Strato-Cruise Control" which gives a pilot an override control of engine speed and performance when desired at high altitude, will be offered as an optional extra.

PIPER FOUR-PLACERS GET STALL INDICATORS—Installation of the Safe Flight Stall Warning Indicator will be standard on all four-place Piper-built aircraft this year. The installation was already standard on the Stinson Voyager and Stinson Flying Station Wagon, which are now part of the Piper line, and the indicators are added to the 1949 Piper Family Cruiser (PA-14) and the new lowest-price four-placer the $2995 Piper Clipper (PA-16).

EMPHASIS ON FOUR-PLACERS—Despite the fact that William T. Piper has sold more two-placers than anybody in the airplane business, he is now convinced that the future of the personal plane business is in the four-place field.

In announcing the Clipper, the Piper organization called it "an important milestone on the road toward eventual elimination from the market of most two-place aircraft except those for training, agricultural or certain industrial purposes."

It is pointed out that the four-placer costs less than many two-place planes currently on the market and achieves the extremely moderate (for airplanes) cost of $750 a seat. When it is considered that the Clipper sells for only about a third more than most new automobiles on today's market, the Piper bargain offering takes on new attractiveness.

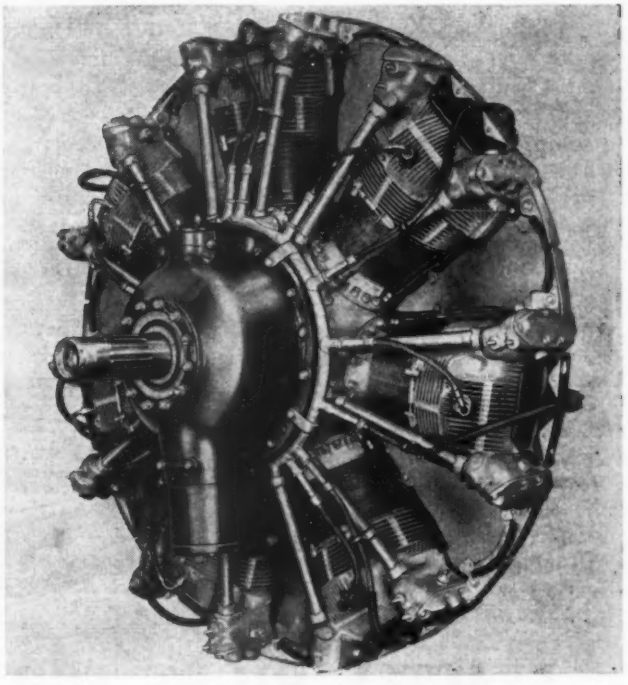
NEW MAITLAND STRIP PROGRAM—Milwaukee Harbor Commission has approved a $150,000 program for further improvements at the downtown Maitland airstrip, which will include an administration building, approach road, utilities, drainage and a seaplane ramp.

Application will be made to get $75,000 of this amount from the federal airport program, and state airport aid is also expected.

—ALEXANDER McSURELY

PLANE The T-28, manufactured by North American, Inc., won an industry-wide competition for an all-purpose Air Force training plane to prepare pilots for high-speed jet aircraft. Top speed, 292 m.p.h. Service ceiling, 31,650 ft.

ENGINE The Wright Cyclone 7BA, an 800-horsepower aircraft engine developed by the Wright Aeronautical Corporation for the T-28 and other military trainers. On its crankshaft and at the propeller thrust location are SKF Bearings.



From trainers to the largest jet planes, SKF Bearings are widely used throughout the Aircraft Industry. Engineering, productive capacity, and special raw material reserves have been set up by SKF to meet the steadily rising bearing requirements of aircraft engine and airframe manufacturers working on armed forces contracts.

No matter what power plant is used—reciprocating or turbine—the preference for SKF Bearings is unmistakable. On vital moving parts, SKF Bearings perform dependably at high temperatures under peak loads over long periods of flight time. For dependable performance *all* the time, make sure that the SKF trademark is on every bearing you use. 6551

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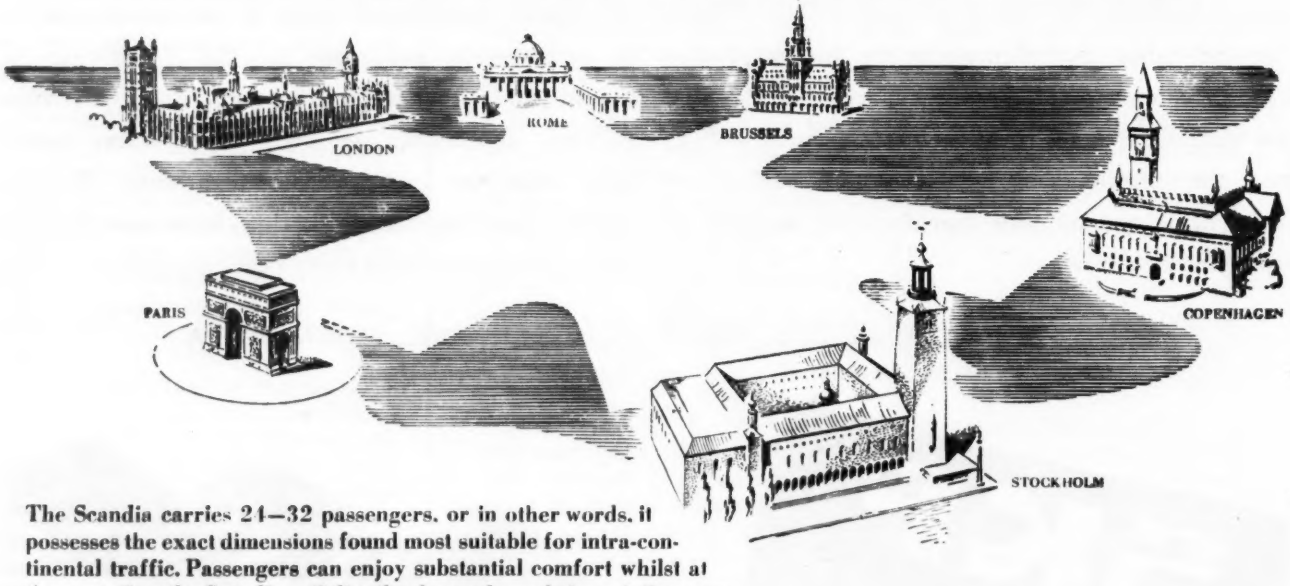

The Scandia carries 24—32 passengers, or in other words, it possesses the exact dimensions found most suitable for intra-continental traffic. Passengers can enjoy substantial comfort whilst at the same time the Scandia satisfies the demands made by aviation companies with respect to safety and economy — in short, the Scandia is an ideal passenger plane. ABA — the Swedish partner in Scandinavian Airlines System — which ranks among the leading European airlines and will accept nothing but the best has signed a contract for a fleet of Scandia planes. This fact and the great interest exhibited in the plane throughout the entire world is a proof that the designers have carried out their task perfectly — not least in their judgement of the requirements for an aircraft of this particular size.

Scandia

SVENSKA AEROPLAN AKTIEBOLAGET · SAAB AIRCRAFT COMPANY · SWEDEN

Carrier Credit Aided by Dividends

Bright outlook for earnings helpful in restoring basic values for common and preferred equities.

Airline credit has been strengthened by maintenance of regular dividend payments on preferred shares of three major air carriers—American, United and Northwest. Such dividend action implies a more cheerful outlook for the period ahead.

This past winter was particularly critical for the industry and considerable doubt was evident as to the continuation of disbursements on these senior equities.

The height of uncertainty existed around dividend declaration time in the closing months of 1948. Despite successful surmounting of that hurdle, considerable uneasiness prevailed when quarterly action again became due early this year.

► **NWA Dividend**—Probably the greatest apprehension surrounded the preference dividend action of Northwest Airlines. Despite a December award of $500,000 in added mail pay, this carrier is estimated to have lost more than $2.5 million last year. Nevertheless, the regular quarterly dividend of 28¾ cents per share was paid Nov. 1, 1948. Subsequent dividend, due Feb. 1, 1949 also was paid as scheduled.

The relative smallness of these two cash disbursements unquestionably was a major factor in influencing the Northwest decision to maintain such dividend payments. With 360,000 shares of 4.6 percent preference shares outstanding, each quarterly payment amounts to but $112,125. The preference shares were marketed in April, 1947, at $25 per share and can boast an unbroken dividend record since. In any subsequent financing that may be attempted, this remains an important attribute to credit standing.

► **Equipment Problem** – Nevertheless, Northwest faces a number of major difficulties before its financial affairs may attain a measure of stability. It is known that the company has been experiencing equipment problems. Yet to come is the introduction of Boeing Stratocruisers in regular service. The company's present bank credit, up to $18 million, originally was created to assist in the financing of such equipment. However, this credit is up for renewal in April. One of the provisions in the original credit specifies that if the Stratocruisers are not delivered by April, the banks have option not to extend the loan.

Currently selling around $18 per share, Northwest preferred shows an indicated yield of 6.4 percent, a measure of its speculative nature.

► **United Preferred**—The dividend action on United Air Lines preferred shares also has been the subject of some conjecture. The regular quarterly dividend of $1.125 per share on its 4½ percent cumulative preferred stock was paid, when due Dec. 1, 1948. This quarterly disbursement aggregates about $106,875 on approximately 95,000 shares outstanding. While no official action has been taken, current market behavior would indicate that the quarterly disbursement due Mar. 1, 1949, may be made on schedule.

Those who doubt such action point to the estimated net loss of more than $4 million for 1948. It is known also that the company is faced with the problem of arranging financing for its Stratocruiser fleet to be delivered this spring as well as the possible replacement of the carrier's fleet of twin-engine aircraft.

Here too, the importance of maintaining an unbroken dividend record is prime in future financing considerations. An asterisk against any company's record denoting a passed dividend is enough to discourage commitments by important groups of investors at some future time when such support may be badly needed.

The United preferred was issued in January, 1947 at around $105 per share. As doubt began to appear as to its credit standing, a steady deterioration in market price developed with quotations around $67 per share, representing an indicated yield of about 6.9 percent. The low point was reached during the second half of 1948 when a quotation of $57.50 per share was established. Supporters of the company are anticipating favorable action by the Civil Aeronautics Board on its pending application which will call for increased mail pay.

► **American Preferred**—The most favorable dividend action accrues to American's preferred shares. Having the largest individual quarterly requirement in dollars has surrounded the company's periodic action with an element of doubt. This existed largely in respect to the dividend due Dec. 1, 1948. Once this payment was made, however, and with highly favorable current operations, there was little question about the company's action on the dividend due May 1, 1949.

American marketed 400,000 shares of $3.50 cumulative convertible preferred shares in June, 1946 with each share price-tagged at $102.

Each quarterly disbursement on these shares aggregates $350,000.

After declining to a low of $47 per share in late 1948 tax trades, the American preferred rallied to a recent price of $60. At this latest price, a yield of 5.8 percent is indicated, showing the best quality among the three major airline preferreds. A significant improvement in American's relative status compared to United is also very apparent. About a year ago there was a spread of almost 30 points between the two preferreds. Currently, this spread has narrowed to about 7 points.

► **Financial Progress**—This is merely a reflection of the strong forward strides made by American in its financial condition. Rapidly replacing its aircraft with all new postwar types, the company has begun to reap the advantages of lower cost operations. Further, no serious financing problem looms ahead for the carrier. It is noteworthy that American not only will report a profit for the 1948 final quarter but is also reported to have been in the black for the month of December. The company's credit position cannot but help improve under such circumstances.

A latent attraction in all three preferreds is the conversion feature. Convertible into common stock, interesting speculative appeal in attached to these senior equities in periods of rising markets. Each share of Northwest preference stock is convertible into one and one-half shares of common. One share of United preferred has a call on four shares of common. American's preferred is convertible into common at $21 per share or about 4.6 shares of common for each share of preferred.

The most unusual air carrier preferred is represented by the senior equity of Northeast Airlines. Issued last year, 83,333 shares of this stock are outstanding. Of this total, 76,959 shares are owned by the Atlas Corp. which acted as underwriter for the issue. The Atlas Corp. also owns 100,000 shares of the common or 20 percent of the total outstanding. Since its issuance, no dividends have been paid on the Northeast preferred and none appear likely in the immediate future.

In the final analysis, improving airline earnings will restore basic values for equities, both common and preferred, in the industry.

—Selig Altschul

UAL, NWA Want More Mail Pay

New petitions recall earlier criticism levelled at CAB by Presidents Patterson and Hunter.

By Charles Adams

Last year's mail pay increases are proving to be no more than a temporary palliative for the air transport industry's financial ills. Prospects are that more of the same tonic will have to be forthcoming—and soon.

Two of the nation's major carriers, United Air Lines and Northwest Airlines, were in a critical condition early this month as large operating losses continued. Even companies which finished 1948 in the black because of substantial mail pay hikes are petitioning CAB for still higher mail rates to offset rising costs.

▶**Probe Not Unwelcome** — Consequently, some industry executives welcome the possibility that the Senate Interstate and Foreign Commerce Committee will hold hearings on the airlines' persisting financial difficulties. The legislative investigation would supplement the Reconstruction Finance Corp.'s study, results of which were sent to President Truman last month.

RFC explored the types of financing best suited to the air transport industry's immediate requirements and long-term needs. The Senate committee would spotlight the mail pay subsidy situation.

▶**Great Injury Seen**—In making urgent new pleas for higher mail pay, United and Northwest have warned CAB that it must act quickly to prevent irreparable injury to the carriers. The petitions criticized Board delays and were reminiscent of statements made by UAL President W. A. Patterson and NWA President Croil Hunter last summer, when they publicly accused the federal agency of failure to carry out its duties properly under the Civil Aeronautics Act.

United has told CAB it "cannot understand how a Board, under a Congressional mandate to maintain sound economic conditions in the U. S. air transport industry, can permit the financial condition of one of the largest and most important carriers to become more critical from month to month without even writing an opinion." UAL last May asked for revision of CAB's "Big Five" decision of Apr. 7, 1948, which raised the company's mail rate from about 45 cents a ton mile to an estimated 59.7 cents a ton mile retroactive to the first of the year.

United is now preparing its annual report for 1948. The company fears that unless CAB acts quickly the report will have to advise stockholders and the public that defaults on obligations are imminent.

▶**Miscalculation Alleged**—Last April's "Big Five" decision intended to fix a mail rate which would enable united to show a net domestic operating profit of $7,625,000 annually before taxes, the carrier asserted. Instead, UAL declared, a net operating deficit of $4,115,719 developed in 1948—a miscalculation of around $12 million.

Company officials said the discrepancy between intended and actual results during 1948 was due almost entirely to CAB's erroneous prediction of future passenger volume. CAB last spring forecast that United would fly 1,380,976,000 revenue passenger miles domestically in a "future year." Actually, the carrier flew only 1,161,773,000 domestic revenue passenger miles in 1948.

The extra 210,203,000 revenue passenger miles predicted for UAL by CAB, but never achieved, would have yielded the company an additional $12,056,165 at 5.5 cents a passenger mile. United said CAB made an error of only one-fifteenth of one percent in estimating company expenses but erred by over 15 percent in forecasting passenger revenue.

▶**Higher Rate Requested**—UAL has asked CAB for a temporary mail pay increase to 87.2 cents a ton mile retroactive to July 1, 1947, or 92.5 cents effective Jan. 1, 1948. The 29.5 cent rate would boost United's domestic mail pay from $5,540,669 to $8,514,409 last year but still would leave a domestic operating deficit of $1,141,979, pending determination of a permanent rate.

The last two months of 1948 resulted in serious losses for United. Through Oct. 31, the carrier had a $2,113,756 domestic operating deficit. A loss of $1,168,518 in November and another of more than $800,000 in December brought the year-end operating deficit up to the $4,115,719 mark.

▶**NWA Crisis Cited**—Northwest told CAB that the Board's decision of last December removing the company from the "Big Five" mail rate case and boosting its domestic mail payments did not go far enough. Immediate relief in the form of additional temporary mail pay is imperative if consequences of far-reaching and lasting effect are to be avoided," NWA declared.

In its "Big Five" decision last spring, CAB tentatively placed Northwest in the same unsubsidized "service" mail rate class with American, Eastern, United and TWA. Two months ago, the Board took NWA out of the "Big Five" category and boosted its mail pay from about 9 cents a plane mile (70 to 75 cents a ton mile) to 14 cents a plane mile in order to increase the carrier's revenues by about $764,000 in 1948.

▶**Revenues Down, Costs Up**—Northwest has now asserted that the new rate actually increased last year's revenues by only $550,000. The company said that grounding of its entire fleet of Martin 2-0-2s during all of September and part of October cut fall revenues substantially after summer business failed to come up to expectations. Further, the company is facing sharply increased costs as a result of higher prices for gasoline and materials and union wage demands.

United's tentative $4,115,719 domestic operating loss for 1948 apparently was the largest in the industry. But Northwest's domestic deficit also was close to the $4 million mark. Both carriers showed profits on their overseas services, but these made comparatively small dents in the overall losses.

Extent to which United and Northwest were losing money domestically during the latter part of 1948 is revealed by November results showing the former with a $1,168,519 operating deficit and the latter with a $693,126 deficit. By comparison, TWA lost only $84,250 on domestic services during the month, and American Airlines earned $99,920.

▶**Dwindling Profits Predicted**—Meanwhile, Braniff Airways, which earned over $600,000 on domestic operations during the first 11 months of 1948 as a result of a substantial mail pay hike last fall (AVIATION WEEK, Sept. 27), is worrying about the future. It has told CAB that because of changing conditions operating revenues are no longer sufficient to produce a fair return on its investment.

Braniff said passenger traffic has declined below a year ago; and while fares have been increased so that gross revenues are higher, they are not keeping pace with soaring costs. Besides rising gas and ground service costs, Braniff called CAB's attention to the expense of putting flight engineers on DC-6s in keeping with a Board order.

The carrier declared it had reduced its schedules to the minimum consistent with maintaining its competitive position and providing the service required by its certificate.

TWA Skycoach Serves K.C.–L.A.

Another certificated domestic "skycoach" service is slated to get under way this week when TWA begins its low-cost DC-3 flights between Kansas City and Los Angeles for a 90-day trial period.

CAB approved TWA's $59.50 coach fare over United Air Lines' protests. The rate represents a reduction of $33.30, or 36 percent, from the regular 6-cents-a-mile Kansas City-Los Angeles air fares. Railroad Pullman rate between the two points is $77.30 and railroad coach fare is $38.60.

► **Night Flights Only**—Westbound, the TWA skycoaches will leave Kansas City at 10:30 pm. and 12:30 am., arriving at Los Angeles at 6:45 am. and 8:25 am., respectively. Eastbound flights will leave Los Angeles at 7:05 pm. and 9 pm., arriving at Kansas City at 6:30 am. and 8:30 am., respectively. Ten minute stops will be made at Wichita, Amarillo, Albuquerque and Phoenix to enplane or deplane passengers.

Hostesses will serve hot coffee aboard the 24-passenger DC-3s, and meals will be available at regular food stops. Skycoach reservations will be made by passengers only at the time they purchase tickets. Roundtrip reductions and family group fares in effect on TWA's regular flights will not apply to the low-cost service.

► **Continental Plan Opposed**—Meanwhile, United has protested against Continental Air Lines' proposal to offer $20 skycoach tickets between Kansas City and Denver starting Feb. 15. UAL said the fare is 37 percent below present plane rates and is unreasonably low, yielding but 3.62 cents a mile. Current air rate of $31.70 is equal to about 5.74 cents a mile.

The contemplated skycoach service over one of its heaviest-traveled routes is not in keeping with Continental's position as a "need" carrier, United declared. It added that there are no basic differences between Continental's regular service and proposed skycoach service. UAL asked that the low fares be suspended pending an investigation.

PAA Sales Up

Pan American Airways' worldwide passenger and cargo sales aggregated a record $130 million in 1948, up about $24 million over 1947. The company carried 907,000 passengers during the past year.

Willis G. Lipscomb, PAA vice president in charge of traffic and sales, predicts that passenger business booked in the U. S. will show a 10 percent gain in 1949.

All American Airways' specially-modified DC-3s are well-suited to the short-hop, short-stop pattern of feederline operations which AAA plans to inaugurate early in March. Picture at top left shows the new-type cargo and passenger doors securely closed. (The telephone on the after bulkhead permits intraship communication as well as air-to-ground radio contact.) At top right, a cabin attendant lets down the ramp, which is built into the cabin door. Below, passengers and cargo are quickly loaded.

AAA To Use Modified DC-3s

Carrier plans suspension of pickup service, activation of 2000-mile feeder system with special craft.

All American Airways, which will suspend service on its ten-year-old air pickup system during the next few months, has set Mar. 7 as the target date to activate its conventional feeder routes with specially-modified DC-3s.

The change in AAA's status was finalized recently when the Civil Aeronautics Board ordered indefinite discontinuance of the pickup service by July 1. Coincidently, CAB issued All American a three-year certificate to inaugurate operations on its 2000-mile feeder system.

► **Routes Overlap**—AAA was designated for regular feeder operations in CAB's Middle Atlantic area decision a year ago. The new system is in the same general area now covered by the mail-express pickup flights which have been conducted with seven Stinsons and two Beech D-18Cs. But the Board had stipulated that feeder service could not be activated until All American's 1522 miles of duplicating pickup routes were suspended or abandoned.

Inauguration of service by All American will bring the number of active feeders to 12. Seven other shorthaul carriers designated for certification by

CAB have not yet started operations. They are Wiggins Airways, Norwood, Mass.; Parks Air Lines, East St. Louis, Ill.; Iowa Airplane Co., Des Moines; Central Airlines, Oklahoma City, Okla.; Roscoe Turner Aeronautical Corp., Indianapolis; Southern Airways, Birmingham, Ala.; and Arizona Airways, Phoenix. Several of these companies hope to overcome financial difficulties and begin service this year.

The Middle Atlantic decision of February, 1948, tentatively awarded AAA these links: Washington/Baltimore to Pittsburgh; Washington/Baltimore to Atlantic City, N. J.; Pittsburgh to Atlantic City; Pittsburgh to Buffalo, N. Y.; Pittsburgh to Cincinnati; and Washington to Wilmington, Del., all segments including a number of intermediate points.

► **More Routes Added**—To round out the AAA feeder system, CAB has now added (contingent on a showing of adequate airport facilities at intermediate points) a new link extending from Pittsburgh to New York/Newark. The Board also has proposed giving All American a run between Pittsburgh and Charleston, W. Va., via Morgantown, Clarksburg and Elkins, W. Va. AAA had agreed to suspension of its pickup links with the proviso that the New York extension be granted.

In anticipation of the latest CAB decision, AAA recently moved its offices and operating headquarters from Wilmington, Del., to Washington, D. C., National Airport (AVIATION WEEK, Jan. 10).

First link to be activated by All American probably will be from Washington and Baltimore to Pittsburgh via five intermediate points. Other routes are to be opened at about three-week intervals.

► **Equipment Arrives**—AAA had four of its fleet of nine specially-modified 24-passenger DC-3 feederliners on hand by the end of January. Douglas Aircraft Co. is modifying the planes to All American's specifications and has been demonstrating them to other carriers during their cross-country delivery flights.

The Civil Aeronautics Board said suspension of All American's service over the nation's only certificated air pickup system is in the public interest because increasing subsidies are required to keep the routes going despite a decline in mail and express handled since the war. Inactivation of the pickup links, which radiate out of Pittsburgh to Cincinnati, Jamestown, N. Y., Williamsport, Pa., and Philadelphia, is the last in a series of steps marking a cooling of enthusiasm in CAB for this type operation.

► **Pickup Service Evaluated**—CAB's decision suspending the pickup routes is in marked contrast to the stand taken in the spring of 1946, when it warmly endorsed the principle of using combination passenger-pickup planes for service to small communities. At that time, the Board saw considerable advantage in the ability of combination planes to pick up mail and express at points where no passengers wanted to enplane or deplane.

But in May, 1947, with Post Office Dept. support, CAB instituted an investigation to determine whether All American's pickup service should be discontinued. Several months later, after weighing safety considerations, CAB turned down All American's request to use modified Beech D-18Cs for combination passenger-pickup operations.

CAB Nonsked Power Challenged by Senator

The Civil Aeronautics Board's power to exercise economic control over nonscheduled airlines has been challenged again by Sen. Pat McCarran (D., Nev.), principal author of the Civil Aeronautics Act of 1938.

Quoting a letter he had written former CAB Chairman James M. Landis in August, 1946, before promulgation of the existing nonscheduled exemption, McCarran told present Board Chairman Joseph J. O'Connell, Jr., that "the Civil Aeronautics Act never, at any time in its history, contemplated the economic regulation of nonscheduled or fixed base operators. If the Board now seeks to enlarge its activity without legislative authority I will condemn it and oppose any such assumption with all the force at my command."

► **Legislation Proposed**—McCarran said CAB proceeded to regulate the nonskeds despite his communication. The Senator added that he is now sponsoring legislation which will, for the first time, give CAB authority to regulate irregular carriers. "For the present," he declared, "I think CAB should stay its hand and give Congress—the only body legally authorized to speak—an opportunity to act on this subject."

The McCarran bill provides that a nonscheduled carrier operating continuously since Jan. 1, 1948, under a letter of registration from CAB would receive grandfather rights to a new license. The carrier would be authorized to operate no more than three roundtrips weekly between the same two points.

Meanwhile, Frederick L. Wehran, manager of Teterboro, N. J., Air Terminal, has called on airport operators to join him in protest against CAB's proposed revision of the nonscheduled exemption. He said that elimination or sharp curtailment of irregular services would be a severe blow to 1000 or more airports throughout the country and to a similar number of affiliated interests.

NO SPEED RECORDS HERE

Jacqueline Cochran, famed woman flyer, and her husband, financier Floyd B. Odlum, chairman of Consolidated Vultee Aircraft Corp.'s board of directors, were grounded as they sat in this cockpit and listened to Pan American Airways Capt. James O'Neal (right) explain the workings of the Dehmel trainer in PAA's LaGuardia Field hangar. Known formally as the Curtiss-Wright Dehmel Electronic Flight Simulator and unveiled last spring (Aviation Week, May 24), the trainer is a perfect replica of a Boeing Stratocruiser cockpit. With its 598 instruments, switches, lights and levers, the electronic cockpit can reproduce nearly every situation the pilot could meet in actual flight. Engines roar and cough and the "plane" vibrates. The air becomes smooth or bumpy; and fog, rain, ice and snow all can be encountered at the instructor's whim. Miss Cochran put the trainer through its paces.

Damon Denies Reports Of Personnel Shifts

TWA President Ralph S. Damon has thrown cold water on reports that he might bring some personnel from American Airlines or American Overseas Airlines into TWA when he assumes his new duties Feb. 10.

"These reports have no foundation in anything I have said or indicated," Damon declared. "My long-felt admiration for the management and people of TWA, for the principles and accomplishments of the organization, is best expressed by the fact that I left a company I had been associated with since 1936 to join TWA."

▶ **Improvement Seen**—Damon said he has been impressed recently with the marked improvement in TWA's operation and progress toward a lower breakeven point. He added that TWA has a sound structure and that its working capital position has steadily improved.

"I have been assured," Damon continued, "that TWA has no intention of selling or otherwise disposing of its foreign routes. I subscribe completely to this policy, which is well known also to be that of Howard Hughes. I do not believe that monopoly, even under such phony labels as a community company or a chosen instrument, is in the public interest."

▶ **Losses Reduced**—Damon will take over TWA's management with the carrier's prospects on the upgrade. Last year's net loss was considerably less than half of the $8,079,761 deficit reported for 1947, according to preliminary estimates.

TWA's international operations during 1948 appeared well in the black as the result of a large mail pay increase in November. Domestic operations have been in the red for the past several months and will show a sizable loss for 1948 pending determination of a final mail rate.

WAL Cuts Food, Fares

Western Air Lines last week eliminated all food service on its planes and cut fares 5 percent in accordance with the "no-meal" tariff submitted to CAB for approval more than a month ago (Aviation Week, Dec. 20).

CAB permitted WAL's proposal to become effective for a six months trial period despite the vigorous objections of United Air Lines, which had asked the Board to suspend the new tariff pending an investigation. UAL said Western could not cut costs 5 percent by doing away with meals. United added that the WAL plan might force UAL to effect a similar 5 percent fare reduction on its non-meal flights while maintaining present rates where meals are served.

Western announced that meal stops would be scheduled along its routes, and passengers will be able to eat at airport restaurants where they will be served at special tables to insure speedy service. Longest trip between WAL cities is 2½ hr. Western's passengers will continue to receive the 5 percent reduction on roundtrip tickets.

Dispatcher Course

A program to train aircraft dispatchers for airlines will be started this month at the New York University School of Education.

Organized in cooperation with the Civil Aeronautics Administration and several commercial airlines, courses will be offered at the University and LaGuardia Airport. They will total 250 hr. of instruction. Class meetings will be directed by Peter Kraught, supervisor of meteorology for American Airlines, and William T. Ferris Jr., training supervisor of field personnel for Pan American Airways. Classes begin Feb. 9th.

Air Forwarder Order Set Aside by Court

The U. S. Circuit Court of Appeals in Chicago has set aside its order of last Nov. 15 which delayed execution of CAB's decision granting operating privileges to air freight forwarders (Aviation Week, Nov. 29).

The stay was granted originally at the request of 15 certificated trunklines which asserted that CAB's decision would injure them by superimposing on the existing air transport system a duplicating system of indirect air carriers which will compete with the direct air carriers for freight business. Both CAB and the Air Freight Forwarders Assn. petitioned the court to vacate the stay order.

Five forwarders, whose letters of registration had been issued by CAB prior to the court's stay order, will again be able to operate under them as a result of the new ruling. CAB also has resumed processing of other requests for freight forwarded letters of resignation.

Airline Labor Disputes Increasing

National Mediation Board handled record number last fiscal year; anticipates even more during this year.

Airline labor disputes are occurring more frequently and are taking longer to settle, according to the annual report of the National Mediation Board for the year ended last June.

With union organization on the upswing among the carriers, it is expected that the high incidence of airline disputes will continue this year. Increasing pressure on operators to resist substantial wage hikes in 1949 will add fuel to labor negotiation difficulties.

▶ **Disputes at Peak**—NMB intervened in a record number of airline disputes during the last fiscal year—50. This was 12 more than the previous year's record of 38. Fifteen more airline labor disputes were handled by NMB during fiscal 1947 and 1948 than during all of the previous 10 years the airlines have been subject to the Railway Labor Act, which NMB administers.

Airline disputes comprised 19 percent of all NMB's mediation cases during the last fiscal year. Yet the board spent 25 percent of its time settling them, indicating they were more difficult than railroad disputes.

The three-man board is concerned about the increasing tendency of disputants to circumvent recommendations of emergency boards. NMB feels that after all the procedures have been exhausted and an impartial fact-finding board has made its recommendations "the implications are strong that the recommendations of such a board would be accepted in good grace by both parties as a proper basis for settling the dispute."

▶ **National Strike Recalled**—The NMB report refers to emergency board recommendations in last year's strike of National Airlines pilots, in which the panel was critical of the carrier. NAL did not accept the recommendations, but a settlement of the 10-month-old walkout was reached last November. A second airline strike during the 1948 fiscal year was the 18-day walkout of American Overseas Airlines pilots which began on Sept. 30, 1947.

NMB sees no need for changing the voluntary procedures of the Railway Labor Act, but warns that they "cannot be disregarded indefinitely with impunity. As public opinion is the chief force behind the law, so will this same public opinion force changes in the law if present procedures prove inadequate."

No real move is under way in Congress to strengthen the Railway Labor Act or to bring it under the Taft-Hartley law's successor. More likely, the Taft-Hartley law will be brought closer to the Railway Labor Act. But the railroad unions would like to have their law amended so that it would permit the closed shop.

SHORTLINES

▶ **American**—National Mediation Board has intervened in the strike threat by 350 radio and teletype operators, members of the CIO Airlines Communications Employees Assn., who are seeking a $50 monthly general wage increase retroactive to Aug. 2 plus other concessions. Present scales range from $175 to $280 a month . . . Company has declared the regular quarterly dividend of 87½ cents a share on its $3.50 cumulative convertible preferred stock.

▶ **American Overseas**—H. Danforth Starr, secretary and treasurer, has resigned to become assistant to the president of Cerro de Pasco Copper Corp.

▶ **British Commonwealth Pacific Airlines**—Will place its new sleeper-equipped DC-6s in service between San Francisco and Australia and New Zealand about the middle of this month. Flight frequencies will be increased at the same time to provide twice weekly service from San Francisco to Australia and weekly trips from San Francisco to New Zealand.

▶ **Eastern**—Planned to inaugurate service to Rome, Ga., early this month.

▶ **KLM**—Convair-Liner flights are now operating between Amsterdam and London, Paris and Stockholm.

▶ **Mid-Continent**—As part of its intensive sales campaign, the carrier plans to offer 20-30 min. familiarization flights to first riders at $2.50-$3 a ride at several of its stations starting early this spring. Company is emphasizing family plan sales and the building of group travel by athletic organizations, alumni associations, military personnel and contest award winners . . . Between Dec. 1 and Jan. 15, MCA planes made 138 landings under weather conditions requiring partial or complete instrument procedures. At least 50 of these landings could not have been made without ILS facilities, company officials state.

▶ **Northeast**—Has elected Albert C. McMenimen of Brookline, Mass., to the board of directors.

▶ **Northwest**—Is installing reversible-pitch propellers on its Martin 2-0-2s at the main NWA overhaul base at Holman Field, St. Paul. Company says the move will result in a "tremendous reduction" of maintenance costs on brakes and wheels. Recent tests showed 2-0-2s equipped with the new propeller required 20 to 25 percent less distance to stop after landing. NWA's Stratocruisers will be delivered with reversible-pitch propellers.

▶ **Pan American**—Mechanical force at Miami has reached a new high of 2100 employees, including 1600 mechanics and 500 engineers, inspectors, foremen and other supervisory personnel. Continued growth during 1949 is expected. Total PAA personnel in Miami numbers 5000, with an annual payroll of $20 million.

▶ **Philippine Air Lines**—Planned to start service to Tokio and Okinawa late last month.

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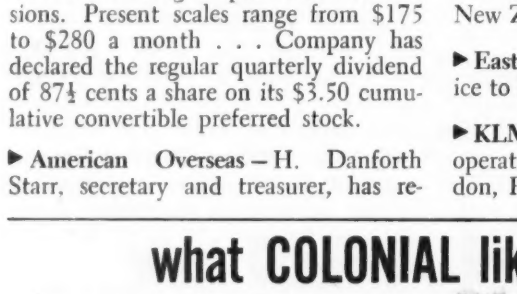
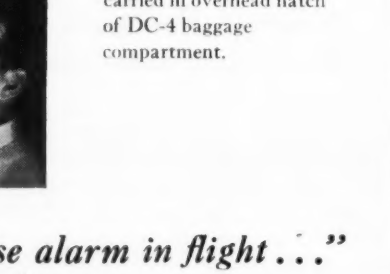
EDISON FIRE DETECTION



MR. F. R. CASSEL, Maintenance Engineer of Colonial Airlines, Inc., inspecting Edison Fire Detection panel units carried in overhead hatch of DC-4 baggage compartment.

". . . have never had a false alarm in flight . . ."

So says Mr. F. R. Cassel, Maintenance Engineer of Colonial Airlines, Inc., whom we recently asked what he considered important features of the Edison Fire Detection System, used throughout Colonial's DC-4 airplanes.



Points listed as important by Mr. Cassel—

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*Copy of Mr. Cassel's letter will be gladly sent on request.

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CAB SCHEDULE

Feb. 9—Hearing on Board's investigation of through service and interchange requirements at St. Louis and Memphis. (Docket 3426.)

Feb. 14—Hearing on Board's investigation of National Airlines route transfer. (Docket 3500.)

Feb. 15—Oral argument on Board's proposed revision of nonscheduled exemption.

Feb. 16—Hearing in reopened Mississippi Valley and southeastern states cases. (Dockets 548 and 501 et al.)

Feb. 21—Hearing on TWA's complaint against Pan American Airways' Saudi Arabian service. Postponed from Jan. 24. (Docket 3264.)

Mar. 1—Hearing on Florida trunkline service. Postponed from Feb. 15. (Docket 2215 et al.)

Mar. 9—Hearing on Board's enforcement action against Transocean Air Lines. (Docket 3244.)

Apr. 11—Hearing in reopened Hawaiian case. (Docket 851 et al.)

May 2—Hearing on additional southern transcontinental service. (Docket 1102 et al.)

LETTERS

CAA Copter Training

CAA is on the ball and is continually running some of their personnel through the course here in preparation for civilian helicopter expansion. Considering the small classes, three CAA men per class recently shows good planning on their part.

The Navy has sent about the same number and plans to use copters for rescue work off carriers.

CAPT. ROBERT C. SELLERS
Liaison Helicopter Training Group
San Marios Air Force Base
San Marios, Texas

Stratocruiser Seats

. . . Thank you for . . . a comprehensive and excellently done report on the Stratocruiser Jan. 10. . . . There is one point that I noticed in connection with the passenger capacity. We believe it is quite proper to include the 14 seats in the lower deck as part of the passenger capacity of the different airline versions rather than using the number on the upper deck only.

In normal operation it is not customary to have a 100 percent load factor, and what will happen is that the seats will be sold on the upper deck and any empties that are left will be left in the lounge.

Thus, in case of extraordinary traffic conditions the airline could if it wished sell lounge seats out for passage just as the railroads met the problem of capacity loads by selling seats in the club cars when the Pullmans were oversold. But normally this would not be the case.

The story states that "To carry a greater number of passengers, this lounge would be installed with conventional seating." The fact is that the present semi-circular seating arrangement that fits the form of this lower deck is the best possible utilization of the space so it is not probable that it would be converted to conventional seating. In other words, we feel that in our airplane you can "have your cake and eat it too." You can have the advantage of an unusually attractive lounge without necessarily sacrificing passenger capacity.

HAROLD MANSFIELD, Director
Public Relations & Advertising
Boeing Airplane Co.
Seattle 14, Washington

More Comment on Copters

Please accept appreciation of McDonnell Aircraft Corp. for your very effective editorial, "Lift the Ceiling on Mercy Copters," Jan. 3. The recognition of the inadequacies of service type helicopters is timely and necessary to the development and production of fully satisfactory service type helicopters.

C. H. HURKAMP, Chief Engineer
Helicopter Division
McDonnell Aircraft Corp.
St. Louis 3, Mo.

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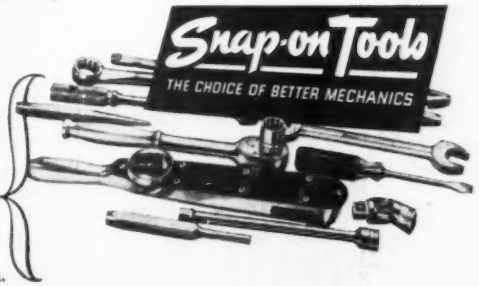

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International Div.: Kenosha, Wis., U.S.A.

tations. I was at Bikini in the Navy Crossroads Helicopter Unit and participated in numerous rescues by helicopter. The need for high performance fully proven service type helicopters is recognized by the low priority consigned to helicopter projects at the present makes the necessary development and production difficult. May the future be more rotary.

C. R. Wood, Jr.
McDonnell Aircraft Corp.

Your editorial seems to me to present ideas that are too little known and I would like permission to reprint some excerpts from it, since I feel they will be timely for a long while.

Charles D. Frazer, Exec. Secretary
National Air Council
New York 16, N. Y.

I read with extreme interest your editorial and the numerous letters regarding it in a later issue. . . . It seems to me one of the greatest problems which now exists is to get such an article as yours reprinted a hundredfold in other pamphlets and magazines, capable of carrying the message yet further.

Stanley Hiller, President
United Helicopters, Inc.
Palo Alto, California

Police Helicopters

To those of us who are struggling through the growing pains of the founding of a new industry, it is indeed refreshing to read such a forthright editorial (on helicopters, Jan. 3). You have again hit the nail squarely on the head . . .

When we delivered the helicopter to New York City Police Dept. a few months ago, the police officials told me that if the helicopter saved just one life "it would be paid for."

Recently, the police rescued a person from Jamaica Bay with the helicopter and, on that occasion, the rescue was accomplished in 18 short minutes from the time they received the telephone call until the rescued party was safe at the Police Dept. hangar. I could not help thinking of this incident when I read the day-to-day news items concerning the many attempted rescues of 12 marooned men on the Greenland ice cap.

The progressiveness of the Police Dept. of the City of New York in serving the many millions of people in the world's greatest metropolitan area might well serve as a guide to the makers of our national policy in the use and development of helicopters.

Again, congratulations on your keen analysis of aviation problems.

David E. Postle, Sales Manager
Helicopter division
Bell Aircraft Corp.

Better Understanding

I have just read the "Metal Outlook" story in the Jan. 10 Aviation Week.

I think you have handled our company's comments very fairly and have contributed towards a still better understanding between the aluminum and aircraft industries.

Irving Lipkowitz, Director
Economic Research Dept.
Reynolds Metals Co.
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New York, N. Y.

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PILOT-MECHANIC, Hold ATR & A&E, 13 yrs. total experience, 5000 hrs. widely diversified aeronautical experience, 2 yrs. college, 5 yrs. Army, 3 yrs. airline co-pilot. Excellent references as pilot and as mechanic. Fully capable to maintain and re-construct aircraft. Interested in position as personal or corporation pilot or connection with operations and maintenance on foreign or domestic assignment. Reply P-7890, Aviation Week.

COMMERCIAL PILOT with ATR seeking position with cargo, sched or non-sched, corporation or private concern. Age 27 with ten years of non-accident experience on all types equipment and all types piloting. Present position not in aviation. Excellent background in business. Will go any place that has good future in aviation. Married, capable, sound judgment. Best of references. PW-7787, Aviation Week.

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STRICTLY PERSONAL

PERILS OF THE INSTITUTE –Despite temptation otherwise, we won't kick this one around. We'll give it to you straight:

In New York the other day during the Institute of the Aeronautical Sciences symposium on "The Upper Atmosphere," one of the audience passed out.

GIVING OUR READERS THE COLD SHOULDER–Some unique words of praise from the Pacific Northwest offer great opportunity for sparkling comment but we resist that impulse. **Moulton B. Taylor,** president of Autocar, Inc., Longview, Wash., writes:

"Dear Sir—We thought we would let you know you have a few readers of Strictly Personal here. All of our little group reads AVIATION WEEK *from cover to cover. If I can't find my copy on my desk, I am always sure to find it in the 'reading room.' I have been able to cut down on this lately by shutting off the heat in there as we are suffering the coldest weather since 1933."*

AIR FIGHTER'S GHOST WRITER–Gen. Chennault's memoirs, just published, is making political and literary news. Its editor is Robert Hotz, AVIATION WEEK's news editor. Hotz has worked nights and week-ends for months on the fiery general's rough drafts. Bob also wrote a book in 1943, "With Gen. Chennault—Story of the Flying Tigers." He was on the general's staff during the war; hit the silk and had to walk back from one bombing foray; flew a B-25 back from another one after its pilot was shot, though he had only Cub training.

Chennault Awards Air Medal to Hotz (1944) at 14th Air Force headquarters, Kunming.

STORY OF THE FIENDISH PILOT–The other day when we threatened to toss an ad in this space if we didn't get enough contributions, **Ken Willard** wrote from Los Angeles: "Belay that ringing cash register. It is a foreign sound, anyway, and has an uncertain regularity in the airplane business. Like Scylla and Charybdis, it leads enticing sailors of the compressible sea into a never ending search for the elusive promises of tomorrow." (Pretty good, eh?)

Then Willard tells this story:

"Too many years ago—even before Hy Sheridan started to write—we had an irascible character who flew the Night Owl from Chicago to New York. If he didn't have something to complain about, you knew he wasn't feeling well.

"One beautiful fall night he arrived at operations, only to find the ship was ready, the crew was there ahead of him, his copilot had the flight plan completed for his approval and, wonder of wonders, all the passengers were already checked in and waiting.

"After a vain search for some loophole, a gleam came into his eyes and he eased over to the weather map, where I was finishing some upper wind analysis.

"Tailwind all the way, I assured him. He umphed. Then he asked how about the weather coming back tomorrow night. Perfect weather going and coming, I assured him; biggest and dryest high pressure area we've had for months. Then beating him to his next inevitable question I reported the dewpoint spread was over 20; not a chance of ground fog. I turned back wondering what he'd finally latch onto.

For a moment he stood there baffled. Finally, sensing defeat, he walked slowly toward the door. As he went by the calendar he looked up and with a triumphant roar exploded:

"'I knew it, I knew it! Gonna have that dam' full moon shining in my eyes all the way.'"

Ken wonders who else remembers that pilot.

REPORT ON BOSTON'S FAMILY PLAN–**Karl Dahlem** of American Airlines in Boston says **Ann Murphy,** their vivacious ticket agent at the Statler ticket office, the other day dutifully and smilingly asked a prospective passenger, "Do you know about American's Family Fare Plan?" and he said "Well, I know how the Family Plan works at home; how does it work with you?" R. H. W.

WHAT'S NEW

New Books

"Way Of A Fighter," the memoirs of Maj. Gen. Claire Lee Chennault, edited by Robert Hotz. A personal account of one of the most controversial figures in military aviation, the book covers Chennault's career from 1917-1948. Included are commentaries on The Flying Tigers, Gen. Stilwell and Chinese politics, all of which have a direct bearing on our present-day Far East foreign policy. Published by G. P. Putnam's Sons, N. Y. Price at bookstores is $4.50.

Trade Literature

"This Is Greene, N. Y.," a homey booklet dealing with the LYON-Raymond Corp., manufacturers of material handling equipment. Pocket size, 32 pages, it contains general information about the company and its working policy. Available upon request to LYON-Raymond Corp., 1017 Madison St., Greene, N. Y.

"Rough Grinding," a 48-page booklet on Norton abrasive wheels and industrial applications of the equipment. Available upon request to the Norton Co., Worcester 6, Mass.

"Verson Die Manual," a handbook of press brake dies, punching attachments and press brakes, 88 pages, illustrated, available upon request to Verson Allsteel Press Co., 1355 E. 93 St., Chicago 19, Ill.

"Standard-Rated Illustrated Furnaces," a survey of furnace equipment for such processes as hardening, tempering, forging, metal melting, etc., available upon request to Surface Combustion Corp., Toledo, Ohio. Specify bulletin SC-141.

"V-Belt Manual," a 100 page booklet designed to assist engineers in designing both multiple and light duty V-belt drives, available upon request to U. S. Rubber Co., Rockefeller Center, New York 20, N. Y.

"Profile Projector," an illustrated bulletin giving details and specifications on a profile projector that embodies new features. Machine is a product of Henri Hauser, Ltd., Bienne, Switzerland. Bulletin available from manufacturer's representative, Hauser Machine Tool Corp., Manhasset, N. Y.

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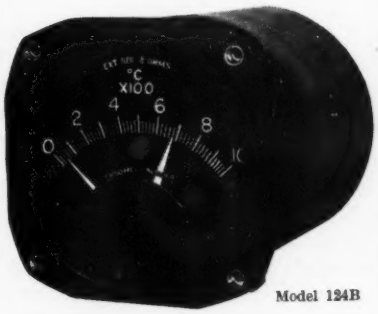

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EDITORIAL

Confusion Unlimited

Sen. Pat McCarran was the father of the Civil Aeronautics Act in the Senate. Rep. Clarence Lea introduced it in the House. The bill was originally known as the McCarran-Lea bill.

So, when the Senator speaks about intent of Congress in passing the bill he should speak with authority. Mr. McCarran has, for the second time, written to the Civil Aeronautics Board—created by his own bill—pointing out "unequivocally and unalterably that the act never, at any time in its history, contemplated economic regulation of nonscheduled or fixed base operators." He has introduced a bill which would permit CAB to license such activities.

The Board, however, under its economic regulations, has assumed control over these groups, and appears to have every intention of trying to put them summarily out of business, purely because of their threat to the scheduled industry that CAB itself permitted to develop, in the present pattern.

The Board fails utterly to see that some of the non-scheduled carriers have not only performed a previously unavailable public service, but that whether they like it or not, many of the revolutionary economies and ingenious short-cuts of the newcomers are here to stay.

It is quite true that the old-line industry has a profound obligation to its stockholders to try to keep living in the manner to which it is accustomed, subsidy included. It is perfectly understandable that both the old-line industry and the CAB should fight those who threatened the status-quo. But in the long view, it appears to us to be a hopeless fight. Stifling ingenuity and technical development in aviation is futile, as in every other field.

If CAB has no doubts or fears about its jurisdiction, the least it could do is to schedule an open hearing as it did on such questions as the feeder airline situation. If it has serious doubts, why doesn't it stop the interminable battle of the lawyers on technicalities, hold the entire irregular and nonscheduled question in abeyance and ask Congress for legislation?

CAA Needs a Leader

The Civil Aeronautics Administration seems doomed to perennial conflict and confusion regardless of its chief administrative officer. But such need not be the case.

The much harassed T. P. Wright played no industry favorites and his honesty and integrity were unquestioned. One of his major problems was CAA's amazing cumbersomeness. Unfortunately, in an effort to simplify and formalize its organization, he forced through a wholesale decentralization program. Several airlines about the same time instituted a similar system of regional duplication, but the airlines were smarter than CAA and they pulled in these freakish appendages. CAA didn't, and hasn't yet.

CAA is still afflicted with a troublesome batch of unruly, headstrong offspring in the regions, each regional office aping the elaborate organizational set-up of the parent in Washington, but otherwise paying it little mind.

The new administrator, Mr. Delos Rentzel, made some initial effort to eliminate and downgrade jobs, but they were inadequate. There are too many people in CAA everywhere, for that matter. But Mr. Rentzel has sought to accelerate the decentralization and his amputations have been restricted to the Washington offices. This is a grave error. Decentralization of certain CAA duties to the states would be workable, and could serve the public. But any move which merely piles confusion on confusion in an already ungainly bureau, is absolutely unworkable and doomed to failure.

It is unfortunate for both the Administrator and the public that Mr. Rentzel's entire tenure has been accompanied by constant and persistent rumors that his appointment was brought about by unusually strong pressure from a small segment of industry who were eager for him to do a quick reorganization job of a certain type, then return after a few months to private industry where his future was assured. Up to now we have ignored this undercurrent, but it is impossible to ignore it any longer because it has become a strong factor in CAA's present and future and has undermined much of the confidence that existed at the beginning of Mr. Rentzel's administration.

The Commerce Department is understood to be concerned about the general deterioration of CAA, and is making its own study of the matter. CAA needs a strong leader, an efficient administrator, backed by a thorough knowledge of all phases of aviation, who will put CAA on a business-like basis and administer without favoritism.

Discovering GCA

An editorial on this page Jan. 10 asked why the domestic airlines still shy away from adopting Ground Control Approach as a primary approach procedure for use in unfavorable weather. Our international airlines use GCA. The question was asked because President Truman's Air Force pilot took the President into Washington National Airport with aid of GCA at a time when airline passengers were either circling the city awaiting better weather, or were being taken to cities they were not interested in visiting.

The question was asked also because the Air Transport Assn.'s own chief engineering and operations executive as long ago as last August had urged the airlines to recognize GCA for regular passenger schedules.

C. B. Allen, an aviation pioneer and pilot himself, who is aviation reporter for the New York Herald Tribune, earlier had interviewed J. B. Hartranft, Jr., general manager of the Aircraft Owners & Pilots Assn. Hartranft had accused the airlines and CAA of stubbornness in refusing to approve GCA for regular flights. He said the American taxpayer "is footing the bill on a colossal scale" for two electronic approach systems.

A Pan American Airways executive now has commented on GCA experience. As told by Mr. Allen, a former member of the Independent Air Safety Board, J. H. Smith, Jr., Atlantic Division vice president of PAA, says:

"Since the Gander GCA was installed, 5500 let-downs had been completed by Dec. 1, 1948, for an average of seven a day. Of these 1957, or 35 percent, were considered as tactical, when the ceiling was less than 1000-ft. and the visibility under two miles; the others were considered as practice and training approaches.

"The majority of the total occurred at night, many in zero temperatures with 50-mile-an-hour gales whipping the snow. The result of this experience has been an overwhelmingly enthusiastic reception of GCA by the majority of commercial pilots who have used it."

—ROBERT H. WOOD

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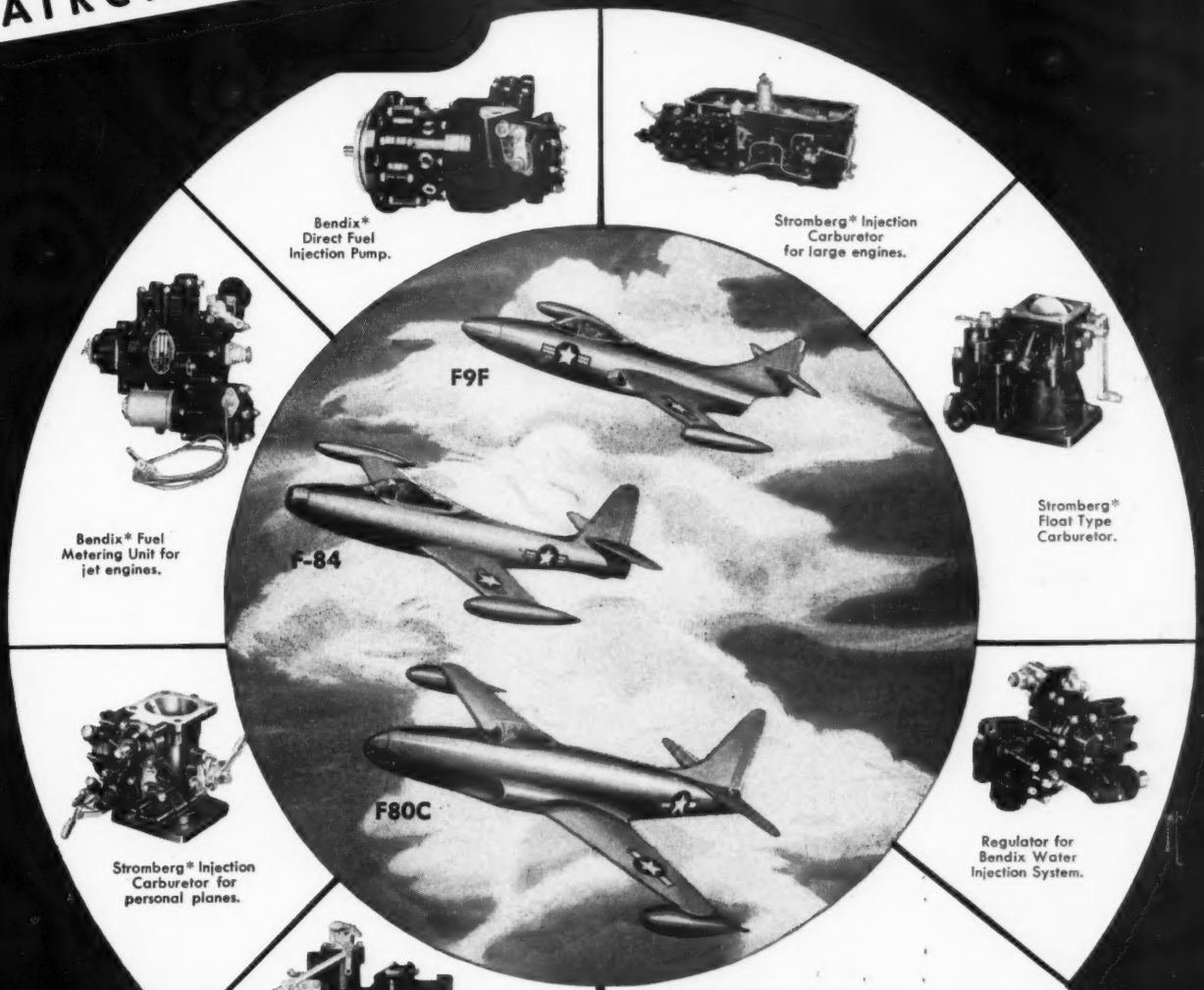

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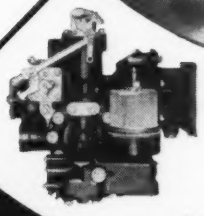

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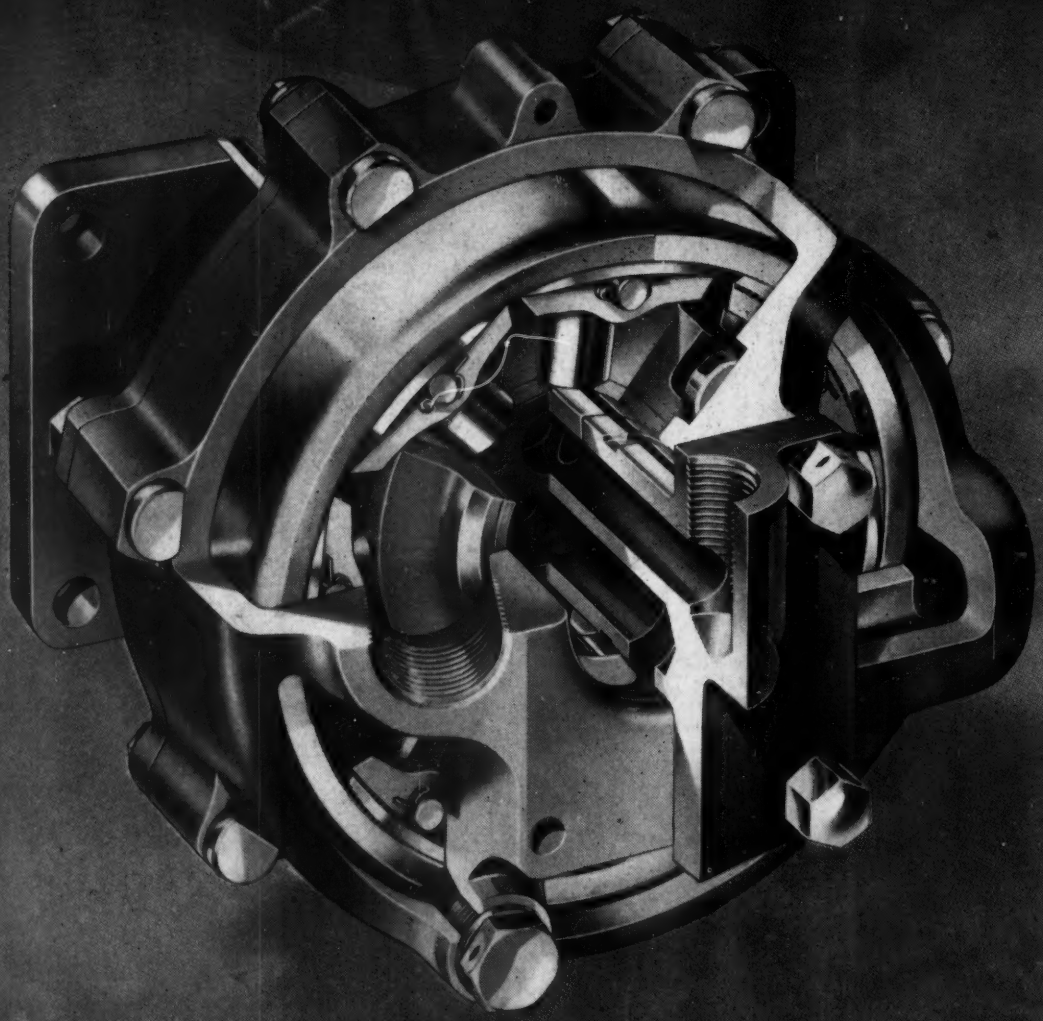

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